McGraw-Hill DIGEST

FEBRUARY 1949

BUSINESS · ENGINEERING · INDUSTRY

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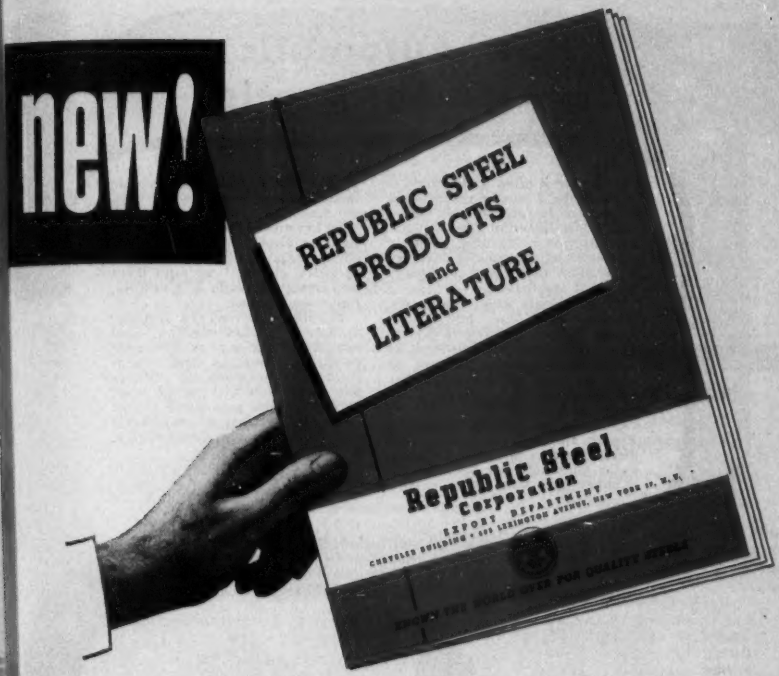
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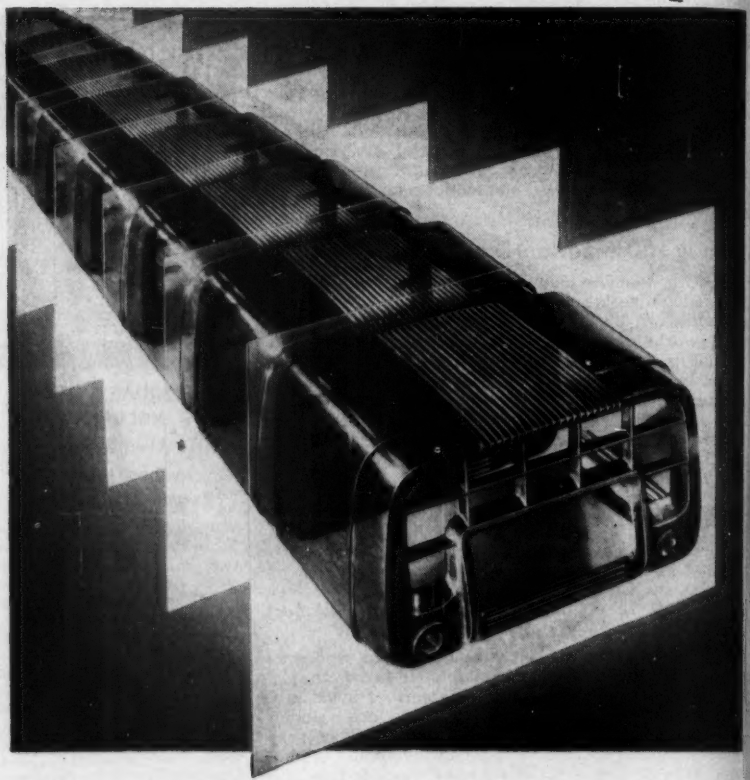

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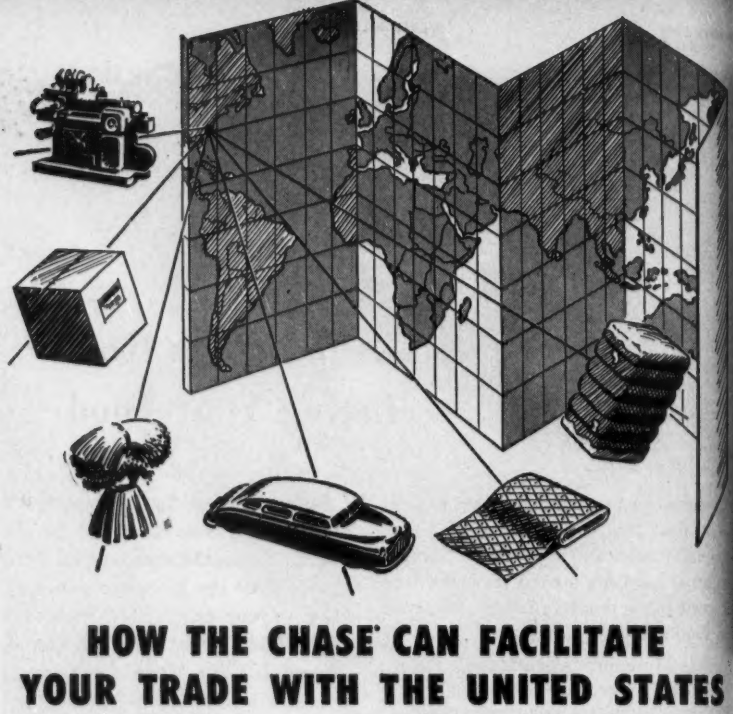

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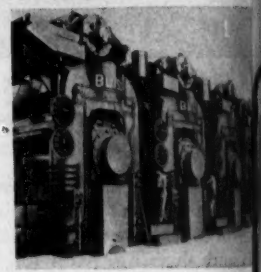

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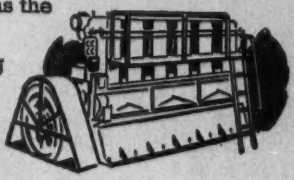

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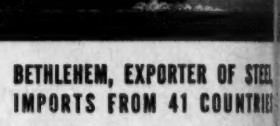

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Business Trends

REPORTS FROM WASHINGTON indicate that the U. S. Congress will be asked for approximately $4.3-billion to carry the European Recovery Program through July 1949-1950. This will be in addition to the $1.1-billion for the April-June quarter. Congress will grant the latter request without much question, but is expected to study critically the second-year program.

Two aspects of the program will be scrutinized thoroughly: first, that European nations have carried through few of the fiscal and trade reforms on which the program was predicated; and second, that the Organization for European Economic Cooperation (OEEC) has not yet been able to harmonize the individual programs of ERP nations for prospective imports and exports into a realistic Master Plan.

The crux of the problem is that western Europe plans to sell more to itself than it expects to buy from itself. European nations already are criticizing one another for unduly curtailing imports from other nations. Another vital factor is that programs of exporting nations assume larger foreign markets, especially in the U. S., than will be available.

WESTERN EUROPEAN NATIONS agree on one thing: a welcome for the $2½-billion they hope to get from traveling American businessmen and tourists over the 4-year ECA period. They expect to accomplish this by raising dollars earned from this source from a current $300-million a year to $800-million in the fiscal year of 1952.

They hope also to gain another $540-million in foreign exchange from travelers from other countries—$80-million from Canada, $260-million from other Commonwealth countries, and $200-million from South America, Asia, and the rest of the world.

NEW WORLD BANK LOANS of more than $150-million will go for economic development in Latin America, Europe, and the Far East.

Brazil: $75-million for expansion of power and phone facilities (Brazilian Traction, Light & Power Co., Ltd.).

Mexico: $40-million for power development, chiefly in the Mexico City area. More funds for irrigation, railways, ports, and highways may be made available—but probably not in the near future.

Philippine Republic: $15-million for two hydroelectric projects on Luzon.

Belgium: $15-million for steel-mill and hydroelectric equipment.

Austria, Czechoslovakia, Yugoslavia, Finland: $8- or 9-million to buy lumbering equipment in the U. S. and to increase lumber shipments to western Europe.

WHEAT-IMPORTING NATIONS find U. S. Department of Agriculture's wheat-crop prediction encouraging for 1949. Forecast is for 1,259-million bushels—

28-million bushels less than 1948 production, but far above the 1937-46 average of 688-million bushels.

The department's forecast is based on an estimated harvest of 965-million bushels of winter wheat and a spring-wheat crop equal to the average for the last 5 years. Winter-wheat plantings rose to 61-million acres—5% over a year ago; yield expected is 15.7 bushels per seeded acre.

NOTES ON WORLD BUSINESS AND COMMERCE:

France is planning to build a $50-million steel mill with ERP funds. "Sollac," a new company made up of eight French firms, will operate the plant. Westinghouse International Co. will do the electrical work on the mill.

India is considering the establishment of a $15-million state-owned factory for manufacture of intricate machine tools. A Czechoslovakian expert has been secured to investigate plant site, type of machines to be made, and equipment needed. Assistance of machine-tool manufacturers in other countries will be requested in setting up the program.

South Africa's import controls are reported to be about 25% effective in curbing gold-reserve drain. Import quotas already have caused factories to be extremely short of raw materials from hard-currency areas. Auto-assembly plants are badly affected, especially General Motors and Ford, both of which have just completed major plant additions in Port Elizabeth. Plans are going ahead, however, on a $50-million project to produce oil from coal near Vereeniging. Government hopes to save $20-million a year on oil imports.

Greece's power and irrigation situation is being surveyed by Ebasco Services, Inc., New York. Appointed by ECA, Ebasco will make an engineering study of hydroelectric-power, irrigation, and flood-control possibilities and economics.

Siam has appointed International General Electric Co. to survey the country for sources of hydroelectric power. The survey will take 10 months and will be done on a no-charge basis. G. E. will probably get any resulting contracts. With Siam now a member of the World Bank, chances for economic development look encouraging. Siam is reported already to be looking for railroad equipment in London.

Western German trade outlook was given another boost in December when a $22-million pact was signed with Spain. Germany will get ores and metals, fruits, chemicals, skins, and cork. Spain will import German machinery, chemicals, electrical equipment, and seed potatoes. This follows by a month a $300-million trade agreement with France and one with Uruguay.

Ruhr management is still in a state of change. Reported effect of seven-nation control board will be to channel Ruhr products into European recovery. Formation of the Ruhr Authority, which will include Germany when she develops a legal government, is a major concession to French demands. Left unsettled is ultimate ownership of Ruhr industries, but former Nazis are definitely barred.

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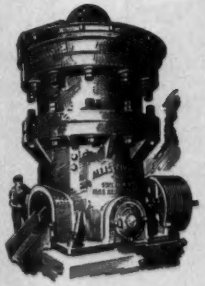

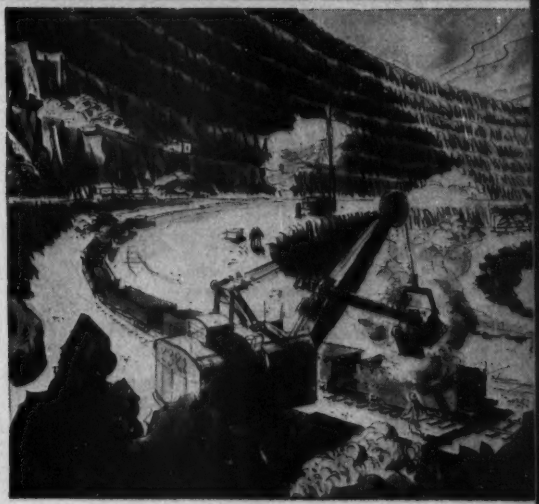

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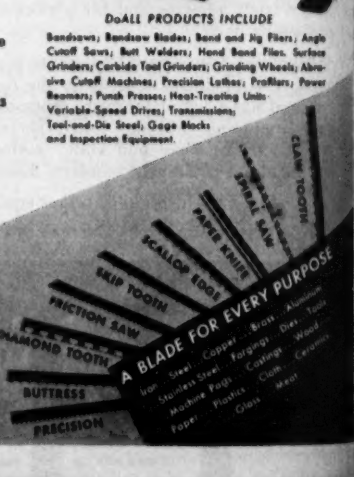
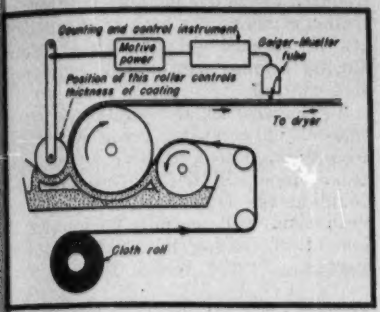
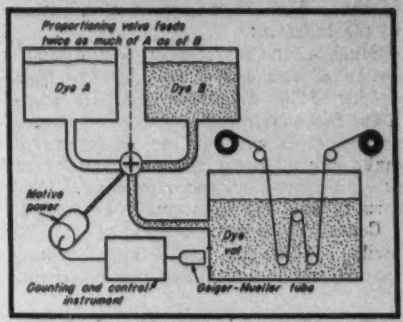




POSSIBLE SETUP to control coating on fabric. Thickness of coating is read by radiation of isotopes in coating.



CONTROL OF DYE is possible where one dye exhausts twice as fast as the other. Here dye B is tagged.

Radioisotopes for Industry

Use of Tagged Atoms in Textiles

TEXTILE MEN, by introduction of tagged atoms into chemical or physical reactions, are now able to pursue tracing procedures and to measure these reactions more accurately than before. To the textile industry, these radioactive isotopes are equally as important as was the microscope to textile research and development.

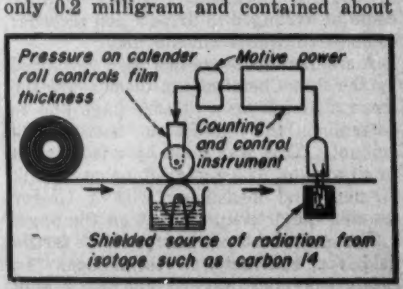
Previously, chemical reactions, such as finishing, had to be analyzed after the reaction had taken place. Now, using tagged atoms, their movements can be "watched" during the reaction, their course plotted, their numbers counted.

The tagged atom is a chemical counterpart of its stable form. Practically every element can be made radioactive, and some transmuted to many radioactive isotopes. Carbon, for instance, has isotope forms C_{10}, C_{11}, C_{12}, C_{13}, C_{14}—C_{10}, C_{11}, C_{14} being radioactive.

Major source of the tagged atoms is the atomic pile at Oak Ridge, Tennessee. There millions of times the number of tagged atoms can be produced that would be produced by 1,000 cyclotrons.

In the textile field, most applications of tagged-atom research has been devoted to fabric finishing and primary rayon manufacture.

In an experiment on rayon yarn finish, Massachusetts Institute of Technology used radioactive sodium as the tracer element to check lubricant distribution on the yarn. Treatment of the yarn was conducted on a laboratory scale, the radiosodium-treated fiber being only 1 cm. long. The 150-denier yarn weighed only 0.2 milligram and contained about


Pressure on calender roll controls film thickness
Motive power
Counting and control instrument
Shielded source of radiation from isotope such as carbon 14

RADIATION measurement from a fixed source controls film thickness.

0.04 microgram of sodium. Distribution of the sodium showed good distribution of the lubricant.

Much of the research on textile application of radioactive isotopes has been conducted by Tracerlab, Inc. Its engineers feel that radioisotopes compounded with coating material on rayon would make a good check for completeness of fire-, mildew-, or water-proofing. Uniformity and thickness could be checked.

Control of dye concentration can be facilitated through use of tagged atoms, particularly in continuous dye processes. If one or more radioactive atoms are introduced to the dye molecule, the concentration either in the bath or on the cloth can be checked simply with a Geiger Mueller counter and electronically operated controls.

A Geiger-Mueller counter in close proximity to a rayon filament after it has been coated with a mixture containing radioisotope will tell coating thickness. Coupling the G-M counter to a servo mechanism will permit fluctuation in amount of coating material applied to filament.—Textile World, D, 103

Radioactivity in Other Industries

POSSIBLE INDUSTRIAL uses for radioisotopes appears limitless, despite the fact that less than 100 of the first 3,100 shipments from Oak Ridge were for industrial research.

In addition to the textile field, radiosotopes are finding, or will find, applications in virtually every industry, including paper, petroleum, and metallurgy. For example, a paper mill could adapt radioactivity techniques to control thickness of the high-cost outside coating of laminated cardboard.

A radioisotope would be used to tag the expensive pulp by adsorption on the pulp fibers. A Geiger counter, placed near the board just after it was formed, would provide a quantitative indication of coating thickness. Counter output could be arranged to drive a pen recorder to show thickness continuously.

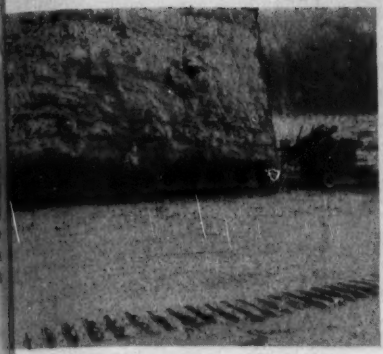
A similar technique has been developed by the Sun Chemical Co. to measure the amount of ink on a printed page and to determine the minimum satisfactory amount. This was done by adsorbing a small amount of a radioisotope on the ink pigment and measuring with a Geiger counter the activity present on the page.

The petroleum industry is a fertile field for radioactivity techniques. In catalyst studies, tagged chemicals may give information on mechanism of catalytic action and on what happens to catalysts carried away with reaction products, particularly when the catalyst is extremely valuable. Tagged compounds also may show how polymerization and cracking take place.

Another application in the petroleum industry is in conjunction with water flooding to improve oil-well recovery. Large quantities of water are forced into one well in a field to displace oil in the porous strata so it can be pumped from other wells.

Sometimes, however, water breaks through into an operating well, making it advisable to cement off that part of the well in which water is flowing. The breakthrough area is extremely difficult to locate with conventional techniques.

Tracer technique simplifies the problem. Small amounts of a gamma-emitting radioisotope, such as cobalt-60, are continuously introduced with the water. The effluent of a well pumping oil is checked with a Geiger counter. More than normal activity indicates a breakthrough. Its position is located by making a gamma-ray log of the well. A Geiger tube is passed down the well, and variations of radioactivity are plotted. Area of highest activity marks the breakthrough, which is then cemented off.—Electronics, Ja, 90



STRIPPED bank after third mining . . .

. . . is a series of these 28-in. dia. holes

Auger Mining Raises Recovery

Use of 24-in. dia. augers gives company 60 ton per shift output with 4-man crew; auger size to be increased

USING 24-in. dia. auger bits and drill rig, F. & S. Coal Co. is third-mining a finger-shaped area first deep mined and later stripped. With the auger rig, the company mines 60 tons of coal per shift with a 4-man crew. Ash content is running less than 3%.

On completion of stripping to a 45-to 50-ft. depth, a 40- to 50-ft. boarder of coal between highwall and worked-out rooms remained. The seam averages 50 in. in depth. Using the auger, a large percentage of this coal can be removed.

Auger consists of seven 6-ft. sections, the spirals being ⅜-in. steel plate hard-surfaced at the edges. Cutter head, including a pilot cutter extending 12-in. ahead of main arms, uses renewable tipped bits, standard to over-burden drilling. Auger is powered by a 32-hp. air-cooled gasoline motor.

Coal deposited by auger drops onto an inclined conveyor discharging into a truck. Haul to railroad siding is 1 mile one driver can handle two trucks.

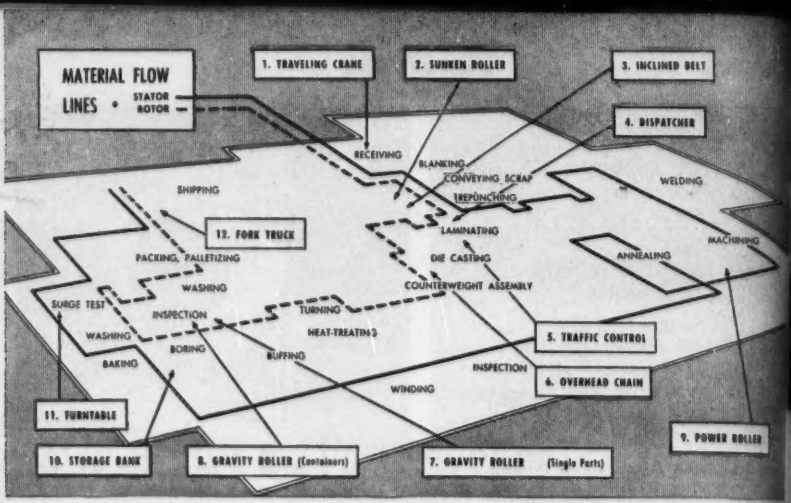
The other three crewmen compose the machine crew. One operates the drill rig, the other two change sections of the auger. Rig is moved from hole to hole by pinch-bar, sliding rig along on greased timbers. Move takes about 12 min. At end of shift, rig is pulled back from highwall on rubber-tired wheels on stub axles fixed to frame.

In changing auger sections, rig operator retracts the boring bar while crewmen roll auger to approximate position, then lift it for engagement and insertion of spring-locked socket pins.

The 24-in. dia. drill cuts a 28-in. hole because of vibration. Plan originally was to stagger holes above and below, but increased diameter does not permit this. Instead, a 36-in. dia. auger is planned for higher extraction.—Coal Age, D, 76

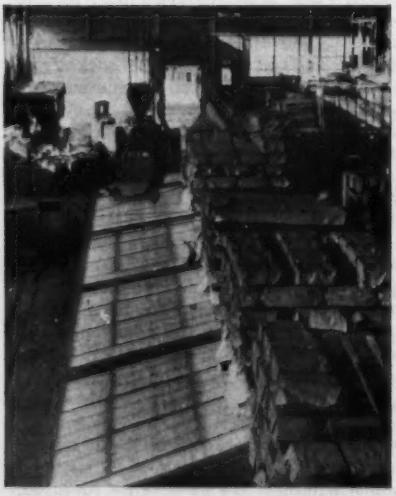
World Economic Outlook

With this issue, the McGraw-Hill Digest presents a survey of the economic outlook for major industrial nations of the world. From Argentina, Brazil, Britain, China, France, Germany, India, and Russia, come predictions of 1949 business.—The Editors



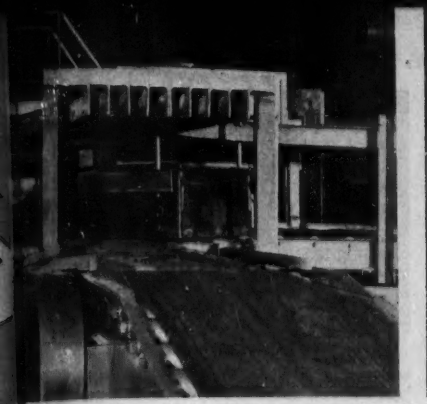
Two-Week Inventory Sufficient

Good plant layout coupled with efficient materials handling syste permits General Electric's Tiffin plant to operate efficiently on only 2 week's inventory; also damaged parts have been reduced and bette quality in both rotors and stators has resulted.—Factory, D, T

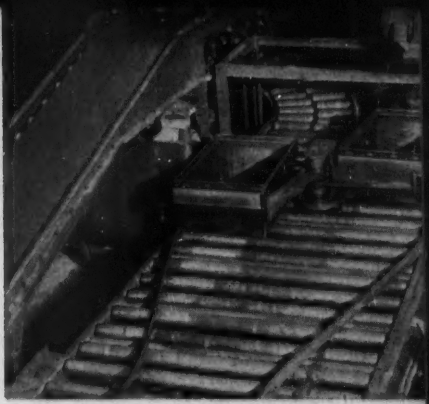


SHEET STEEL is handled by overhead crane from box car on siding. It passes either directly to presses or is placed in storage. Receiving area is 10,000 sq. ft.

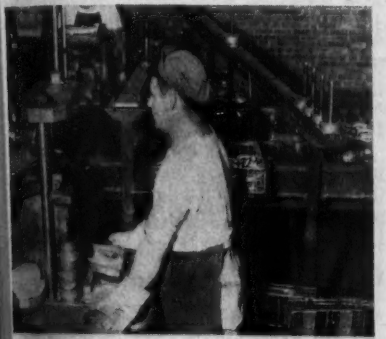
SUNKEN ROLLERS carry rotor and stat stampings in tote pans from presses to ne station. Scrap from presses is carried underfloor conveyors to gondola cars.



DIRECTION of flow of tote pans, moving along conveyor from blanking operation, is controlled by pins set in sides of pans.



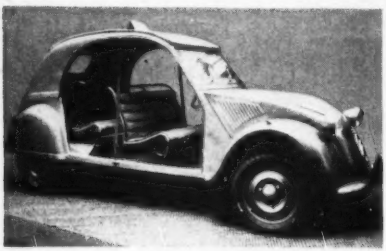
JAMMING of empty tote pans returning on main belt from presses is prevented by this traffic controller at conveyor Y.



SINGLE laminations are carried by gravity rollers on molding pin to casting press. Pins are returned by conveyor.

STATOR weldments are carried to and from treating furnace by conveyor. Speed is regulated to equal cooling time.

FINISHED STATORS are stored on U-shaped conveyor sections. Stators passed are placed in special carriers; rejected stators are moved by overhead to repair center.



UTILITARIAN, LOW COST . . .

Listed at $593, Citroen's four passenger runabout weighs 1,000 lb. Its air-cooled, valve-in-head engine will give 58 mi. per gal. of gasoline. Transmission gives four forward speeds, fourth being an overdrive. Body is of one-piece, all-steel, bolted to box section chassis. Roof is canvas; seats are canvas over tubular frames.

. . . LUXURIOUS, HIGH PRICED

Now a 4-wheeled automobile, E. E. C. Mathis' new car will have six forward transmission speeds, the fourth direct, the fifth an overdrive, and the sixth a super-overdrive. Motor is L-head, flat 6-cylinder type with 174-cu. in. displacement. Wheelbase is 104 in.; internal width is 59 in. It weighs about 2,150 lb.—Am Auto, D, 64

Primary Loop Serves Modern Printing Plant

Reliable power system is a necessity in a plant such as the R. R. Donnelley & Sons Co.'s new printing plant, Chicago. Service reliability here required the design and installation of a dual system of primary distribution, with all feeders normally supplied by two transformers operating in parallel.

Power is supplied by a 12-kv. loop line providing a dual feeder system from power company's substations to plant's 12-kv. buses. Normally, the complete loop is closed and electricity is conducted over both halves of the loop to the 12-kv. buses.

Each loop section is equipped with breakers having differential protection. A cable failure will automatically open breakers on faulty section, but the plant still receives power over the other half.

Primary distribution was selected in preference to secondary distribution after a cost analysis was made. It was found that cost difference would pay for the plant's share of the primary switchgear, primary ducts, and cables and for all power and light transformers.

Furthermore, primary distribution provides better voltage regulation, flexibility, service continuity, efficiency, simplicity, and maintenance.—Elec C&M, D, 51

Incentives Cut Repair Bills

Adoption of the incentive system in the rejected parts repair shop of Ritter Co. has cut repair hours from 6% of production time to 3%, and costs should drop still further. Previously repair work had been on a guaranteed rate basis. The industrial engineering department blamed high costs on the lack of incentive for repairmen.

Equitable repair time was estimated by the department—cost of setting rates being only a fraction of the saving. When repairs are necessary, no work is done until an estimate has been made. Times are established for each step in the repair operation. A progress check is made by the department immediately to locate cause necessitating the repair. This follow-up has materially aided in reducing costs.—Factory, D, 123

Mexico Builds Its Industry; May Repeg Peso This Year

Mexico is in its second year of President Aleman's administration and the third year of its new deal. Yet she is troubled industrially and economically if not politically. Cost of living continues to rise; gold and dollar reserves have dropped sharply; the peso is unpegged.

In 1920 the country was the world's number two producer of oil—180-million bbl. Now it is sixth and exports only 15-million bbl. Drop came after British, Dutch, and U. S. oil properties were expropriated in 1938. Now talk is being revived to bring foreign investors back into the oil picture. Pemex is the national oil monopoly. Major problem now is that the government needs a quick return to economic stability and oil would be a slow path.

Since July 1948, when the peso was unpegged, its value has dropped 40%. Exports did not rise appreciably but nonessential imports were cut. This reduced the country's unfavorable trade balance with the U. S. 25% over the previous year. There is speculation that the peso will be repegged early this year at 6.90–7.00 per dollar.

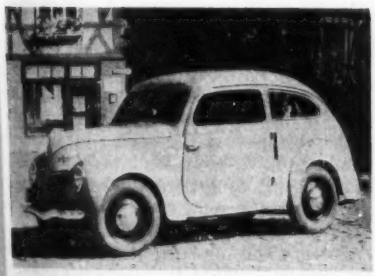
Industrial progress within the country has been rapid since the war. In 1939, there were under 13,000 industries; today there are over 35,000. Overall production is up 40%. Since about 75% of the country's population derives its income from the soil, agricultural progress must match this industrial growth if industrial products are to be sold locally.—Business Wk, D 11, 106

Eases Bearing Assembly

Replacing a hardened steel bearing—13½-in. O.D., 1-in. wall thickness, and 5 in. long—into a machine housing was simplified by using liquid nitrogen as a coolant to obtain a shrink fit.

Previous technique was to use dry ice, but the job required over-night cooling and press forcing. The job now takes 10 min. for cooling and dropping the bearing into its housing.

A container was built of light-gage sheet steel, formed into ring shape to receive the bearing. The container was then insulated with magnesia, the bearing placed inside, and liquid nitrogen at —320.4° F. poured in until the bearing was completely immersed. Shrinkage reduced diameter quickly by approximately 0.030 in.—Am Mach, D 16, 82

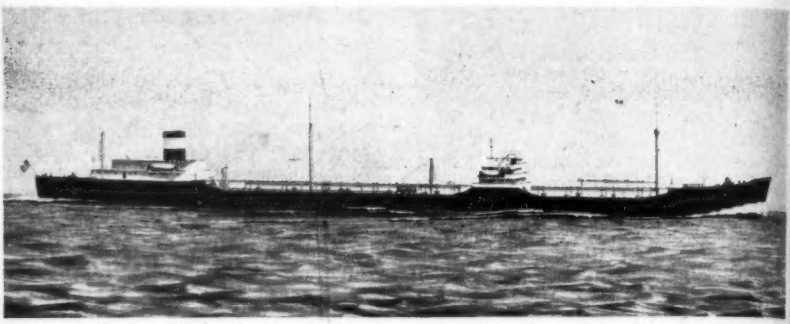


GERMAN FORD

First post-war passenger car turned out by the Ford works in Cologne, Germany is this Ford-Taunus '48. Built for the domestic market, the 4-cylinder car will sell for 6,965 Deutsche Marks, approximately $2,000.—Business Wk, D 18, 21

AUSTRALIAN HOLDEN

Australia's first postwar car is General Motors-Holden, Ltd., 5-passenger, 6-cylinder car now coming off assembly lines. Only 5% by weight of parts and accessories are imported. Car gets 30 mi. per gal.—Business Wk, D 11, 108



Larger Tankers Built for Speed

Deadweight of new tankers range from 26,000-30,000 tons, double prewar tonnage; construction procedures and cargo handling change

TANKER PRODUCTION in the United States is directed toward increased power, speed, and deadweight. Current tankers of 26,000–30,000 tons are in sharp contrast to the 13,000–17,000-ton vessels built just prior to the war. Other changes too are noted.

Many modern tankers now are built with twin longitudinal bulkheads—only one ship since 1936 has been built with centerline bulkhead and summer tanks. Design usually follows the "poop, bridge, and forecastle" design although one class has appeared with a combination bridge and poop with normal forecastle, the after centerline cargo tanks extending to the poop deck. All vessels have aft-located machinery.

Normally, cargo tanks are 35–40 ft. long, further subdivision being provided if several grades of cargo are to be transported. Pump room is usually aft, serving as a cofferdam between cargo and machinery space. The after pump room location is of advantage as electric-motor or turbine drive for pumps can be located in machinery space. Where mixed cargoes are carried, pump room may be located midship. This location reduces sagging bending moment.

Increase in speed has been accompanied by an appreciable reduction in fineness of under-water form. Many of the newer tankers have been built with "flat sheer," that is, zero sheer on the centerline. Flat sheer is a natural characteristic of large-deadweight vessels having a practical draft limitation.

Maximum practicable draft is being approached by the larger tankers. It follows that further deadweight increases will be obtained by increasing length and possibly breadth. Accepted displacement-length ratio and length-breadth ratio will have to be revised.

Most new tankers are being built on the longitudinal system of framing. In some vessels longitudinal and transverse framing have been combined—deck and shell being longitudinally framed and sides being transversely framed. This framing is associated usually with vertical stiffening on the longitudinal and transverse bulkhead.

Two methods of transverse and longitudinal bulkhead construction are fluted or corrugated plates or flat plates with welded stiffeners. Fluted or corrugated construction represents a weight saving.

Welded hull construction is on the in-

crease, but some builders still prefer a few riveted seams in shell and deck plating.

More attention is being given to dehumidification of cargo tanks to reduce corrosion and minimize possibility of cargo contamination. For large-capacity tankers, centrifugal-type pumps appear best suited for cargo handling. The non-self-priming feature of the pump can be offset by adding a priming unit and a vacuum chamber or by a separate displacement stripping pump.

Use of CO_2 as a fire-fighting agent is losing some of its popularity. Foam-type extinguishers (powder or liquid) appear best suited. In some vessels, cooled flue gas is introduced into the void space of cargo tanks. Gas is passed from stack through a cooler and scrubber and then piped into tanks. The gas, being inert, prevents accumulation of inflammable gases.—Marine Engrg & Ship Rev, N, 36

Electroplating Alloys From Cyanide Baths

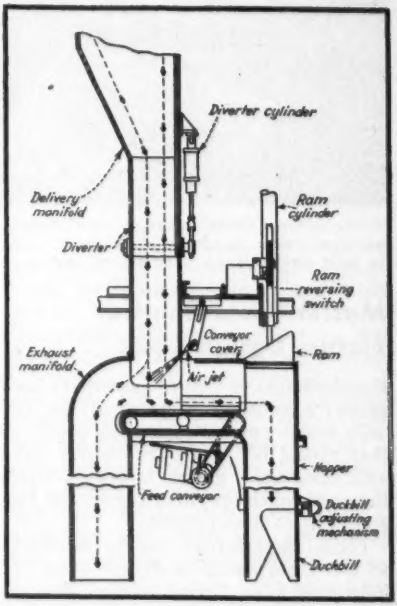
Two or more metals may be deposited from an electroplating bath only under special conditions. The most successful baths are those that are similar to single-metal baths, with addition of a second soluble metal. Cyanide baths have proved applicable to a wide range of alloy compositions of copper, silver, zinc, and other metals.

Plated alloys are in the form of solid solutions and often have the characteristics of cold-worked cast alloys. Greatest commercial success to date has been in combinations of copper, tin, and zinc.

Alloy baths, as a rule, require closer control than single-metal baths, because deposits must be held within a range by analysis or color as well as by quality. Sometimes, an alloy bath may be easier to control for quality, as the second metal may act as an additional agent; cobalt-nickel bath is an example of this action.—Iron Age, N 25, 84

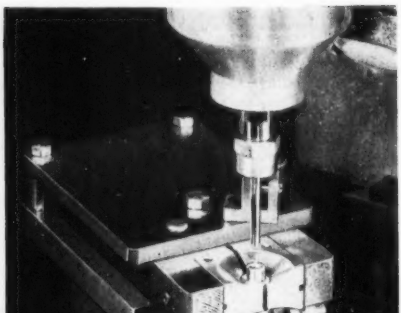
Frost Cuts Road Capacity

Tests conducted on black-topped roads by Minnesota Dept. of Highways indicates that when frost is coming out of road bed the carrying capacity of the road is reduced 50% or more. All types of soil from sands and gravel to clays seem to be similarly affected. Results will be used by the department to substantiate a ruling that legal load limits on black-topped highways be lowered during thaws.—Eng News-Rec, D 9, 88



CONTROLS INSULATION WEIGHT

Packaging machine of Union Bag & Paper Corp. has air blast to divert excess rock wool insulation. Material is fed alternately to two conveyors. When desired weight has passed onto one conveyor, diverter in feed spout transfers flow to other conveyor. As weight of material falling from diverter to conveyor cannot be predicted accurately, an air blast ejects excess material to exhaust manifold. Ram then compresses insulation in bag under duckbill.—Prod Eng, D, 95



AIR-OPERATED master vise fixture, equipped with hardened-steel insert jaws to hold parts, is an example of how . . .

Master Bases Can Cut Fixture Design Costs

Standard master fixture bases have been proved economical by years of use, but even so are not yet applied as widely as they should be. They are easy to make and, once their design is standardized, they cost much less than the special jigs and fixtures they replace.

Little engineering time is necessary to tool these standard fixture bases for individual jobs. Usual practice is to select the master fixture best suited to a job and then to explain to the toolmaker how the fixture is to operate. This, together with a part drawing, is all that is needed; even simple pencil sketches are used rarely.

Standardized master fixtures are considered to be generally of better quality and to maintain accuracy longer than fixtures designed for single-purpose applications. Replacement of worn parts can be made with stock items, and master bases can be reused.

Standard fixtures can be easily selected as to type and size by consideration of operation to be performed, shape and size of part, and production rate required. Thought should be given to part handling also. Fixture height, angle of placing part, direction of hand movement, and similar factors should be studied carefully.—Am Mach, D 2, 83

Interest High in "Tribian"

Sponson Developments Ltd.'s (London) "Tribian" 3- to 4-place, twin-engine, all-metal amphibian is creating much interest among small feederline operators, especially since plans call for a slightly larger version of the plane at a later date. Marked advantage is gained from use of sponsons—added stability over wing floats, reduction in necessary wing area, faster breakaway from water, added stiffening for undercarriage.

Main landing gear retracts into the sponsons; nose wheel is housed in hull. Wheel retraction is hydraulic. Conventional wing construction employs two-spar box-frame design with fabric-covered ailerons and split trailing-edge flaps. Wing tips and tail-plane tips are detachable, and made of molded "Py-trom", a laminated paper-based, resin-bonded material. An improvement on faired-step design, hull is a two keelson type, braces spaced 12-in. apart and running to rear of step.—Aviation W D 6, 20

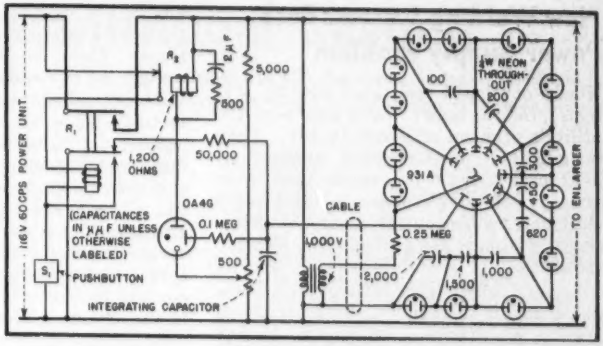
Raceways Do Double Duty

Surface raceways at the new Georgia plant of Holeproof Hosiery Co. serve a double purpose. Suspended from roof trusses, they provide wireways for branch feeders and also act as fixture hangers.

The steel raceway is installed in a grid-pattern network and, consisting of channel with snap-on cover, permits in

DARKROOM TIMER

New timer using multiplier phototube turns off photograph enlarger at end of proper exposure. Tube scanning enlarger easel times exposure in accordance with negative density, lens aperture, and lamp brightness. Dynode voltages are stabilized by regulator of ¼-w. neon lamps. Unit is operated by push-button S_1, actuating relays R. — Electronics, Ja, 101



stallation of duplex outlet receptacles wherever required.

Special hangers are mounted on the raceway and to them are attached the chain hooks of the fluorescent lighting fixtures. As hangers can be mounted quickly and new receptacles installed easily, fixture location can be changed readily to provide light where needed.—Elec C&M, D, 71

Low-Temperature Properties of Chromium-Nickel Steel

Research by U. S. National Bureau of Standards on 18:8 chromium-nickel steels dealt with their mechanical properties at temperatures down to −188° C.

It was found that hardening and strengthening at low temperatures depend on amount of prior cold working the steel has received at room temperature. Strength increase is greatest for annealed steel and falls off with increase in cold working.

Metastable austenitic steels have good ductility at low temperatures. In this respect, they are similar to nonferrous metals having face-centered cubic structures. Ductility of the ferritic precipitation-hardened 18:8 steel, however, decreases rapidly with decrease in temperature. At liquid-air temperature, it is brittle.—Steel, D 20, 82

Service to Digest Readers

As an added service to McGraw-Hill Digest readers, the following special reports from other McGraw-Hill publications are made available for purchase. These reports, too long for inclusion in the Digest, will be sent on receipt of one dollar for each report desired. Address editor, McGraw-Hill Digest, 330 West 42nd St., New York 18, N. Y., U. S. A.

Construction Materials—Object of this 32-page report is to present, for 17 common chemicals, a concise summary of good, up-to-date practice in the selection of construction materials. Flowsheets show the production of each chemical—with each item identified as to construction material.—Chem Eng, N

Fuels and Firing—This report, in 48 pages, tells how fuels burn, gives facts about commercial fuels, describes firing equipment, shows how to select fuels wisely for new or old plants, and outlines short-cut methods for checking efficiency. —Power, D

Horizontal Broaching Fixtures—A 16-page handbook, the report includes the latest information on horizontal broaching machines, methods, and fixture design. Both internal and horizontal surface broaching are treated, with many jobs illustrated to show modern practice. —Am Mach, D 16

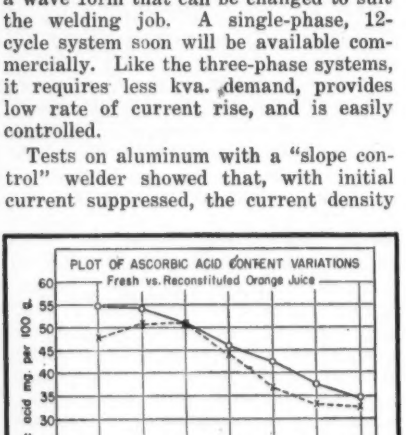
New Welding Systems Ease Power Supply Problem

Newly developed resistance-welding systems produce better welds and ease the utility's problem of power supply. They include (1) low-frequency systems of 5–12 cycles, both for single and three phase; (2) single-phase welders with electronic "slope control"; and (3) three-phase systems using disk-type metallic rectifiers.

Instead of a sine wave, the three-phase low-frequency converter produces a wave form that can be changed to suit the welding job. A single-phase, 12-cycle system soon will be available commercially. Like the three-phase systems, it requires less kva. demand, provides low rate of current rise, and is easily controlled.

Tests on aluminum with a "slope control" welder showed that, with initial current suppressed, the current density during the first cycle is about one-third that without control of the envelope slope. Thus temperature at points of contact of electrodes and work is lower.

The dry-disk rectifier welder has the rectifier made up of a group of heavy copper plates assembled on bolts with disks of magnesium and disks of copper-sulphide-coated copper inserted between the plates. This system demands reactive power only during the two-or three-cycle period of current rise. It also has a 99% power factor and draws a welding current limited only by the dc. resistance in the system.—Elec World, D 18, 74



RETAINS ASCORBIC ACID

Ascorbic-acid (vitamin C) retention in quick-frozen, concentrated orange juice was determined over several months by Vacuum Food Corp. Determinations were made six daily, on both reconstituted and fresh juice. The former showed higher vitamin content because of higher concentration of solids. Fluctuation from month to month was due to variation in fruit.—Food Ind, D, 111

Unusual Techniques

A new appearance in plastics is being produced by a molding process that incorporates a design printed on resin-impregnated paper in flat plastic surfaces. The design looks like a decal-comania but does not wear off.

• Extrusion of thin-walled plastic tubing to a 0.001-in. tolerance is accomplished by adding a cooling sleeve to the standard extrusion die. An 8-in. tube with bore etched to a matte surface, is employed in making 1¼-in. dia. tubes at a rate of 80 lb. per hr.

Testing turbine blades for fatigue subjects specimens to two types of loading at once. The machine applies alternating flexure loads up to ± 1,350 lb. at rate of 3,600 cycles per sec. and tensile loads up to 8,000 lb.—Prod Eng, D, 5

Water-Powered Timber Jack

Aluminum water-powered timber jacks replacing timber horses and lifting bars in the coal mines of the Kaiser Co., Inc., have materially simplified placing of crossbars. Jacks operate off sprinkler system lines at normal working pressure of 35 psi. Composed of a fork, three telescoping aluminum sections, a foot and two valves with nipples, jack will remain in position as long as inlet valve is open.—Coal Age, D, 104

Widens Centrifugal Casting

Development of process involving use of refractory coating in mold makes commercially feasible production of long tubular shapes in various metals

NEW CENTRIFUGAL CASTING technique, for production of metals in long tubular shapes, has been developed by the United States Pipe & Foundry Co. In this process, a thin refractory coating of controlled characteristics is applied to the interior surface of the heated metal mold.

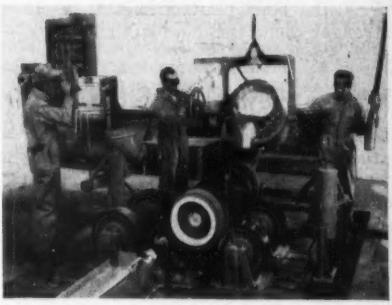
The coating offers both traction and momentary insulation to the leading edge of the molten stream as it enters from one end. Skidding and excessive thinning of the advancing stream are avoided.

Furthermore, formation of laps, cold shuts, and pinholes is prevented. Thus long tubular bodies of constant wall thickness can be generated with all the benefits of rapid solidification and without the need for tilting the mold or using a retracting trough as in the de-Lavaud process.

Coating characteristics depend on type of metal being poured, length and diameter of castings, their wall thickness, and coating compositions. Typical slurry compositions, which are applied by spray gun, contain 500–1,000 g. of silica flour and 10–40 g. of bentonite per liter of water. Mold heat causes nearly instantaneous evaporation, leaving the atomized refractory droplets where deposited.

Surface roughness, thickness, friability, and insulating qualities of coatings are controlled by modification of slurry composition and method of application. Roughness is controlled by angle of spray nozzle, air pressure, distance of nozzle from mold wall, and thickness of coating applied within a given time.

Average coating thicknesses required for different metals and casting sizes range from 0.01 to 0.08 in. Multiple passes of the spray lance may be needed for greater thicknesses. Molds must be recoated for each casting. Residues from the previous cast are readily removed by air jet or wire brush.



CENTRIFUGAL casting in metal molds coated with refractory permits orderly distribution of metal within spinning mold for either single-metal or dual-metal castings

Despite friability, the coating is not washed away by force of metal entering mold. Nor is there any marked crushing effect on the nubby protuberances that control metal flow. These protuberances may range from 10–50 per in., with a preferred range of 20–25 and average height of 0.005–0.050 in.

One of the most significant applications of this new process is production of tubular shapes combining two metals metallurgically bonded and concentrically cast. Stellite, Hastelloy, stainless steels, tool steels, or other highly alloyed metals can in effect be clad on lower cost metals in tubular shapes.

Examples of dual metals are grinding rolls with white-iron shells and gray-iron cores, diesel-engine cylinder liners of mild steel and gray iron, and copper- or Monel-lined steel tubes.

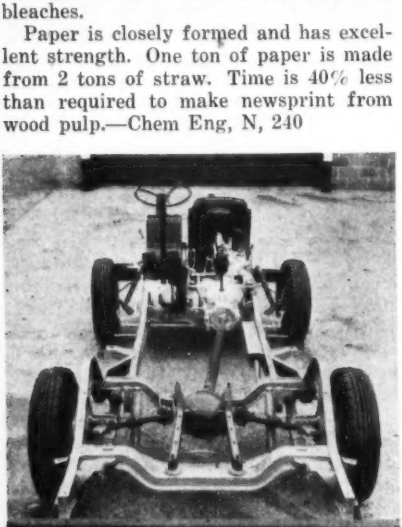
In producing dual-metal castings, metals are melted in separate furnaces.

The outside metal is poured into the spinning mold and then followed by a molten flux. The inside metal is next poured. All fluxing compound is displaced to inner surface of casting. With proper timing between pouring operations, the bond between metals is made stronger than the metals themselves.—Iron Age, D 2, 94

Makes Newsprint From Straw

Kinsley Chemical Co. has developed a process for manufacturing newsprint from straw. It involves the following steps: cooking straw for 6 hours; refining to get a long thin fiber; putting through deckle washer, screen and two bleaches.

Paper is closely formed and has excellent strength. One ton of paper is made from 2 tons of straw. Time is 40% less than required to make newsprint from wood pulp.—Chem Eng, N, 240



UNIQUE DELIVERY TRUCK

New Dodge Route-Van has floor 10 in. lower than other door-to-door delivery vehicles. Floor lowering was made possible by use of driving axle which operates separately from load-supporting axle. Other chassis features include 13-in. kick-up at rear of frame and offset engine to permit greater use of front-end space.—Iron Age, N 4, 132

Induction Brazing of Tricky Radio Components

Hoffman Radio Corp. discarded gas-torch heating in favor of induction heating for assembly of fm. dummy-antennae. The antennae were to be formed of two cone-shaped, 0.03-in. thick, silver-plated copper spinnings brazed to a ¼ x ½-in. brass mounting ring.

By using a 5-kw., 450-kc. Westinghouse generator and current transformer, it was found that a single-turn coil, encircling the joint, delivered 3 kw. of rf. power to the brass ring. As the ring heats, preplaced brazing alloy melts and wets the ring. As heating continues, ring heat brings spinnings to brazing temperature and alloy wets spinnings and flows into the joint.

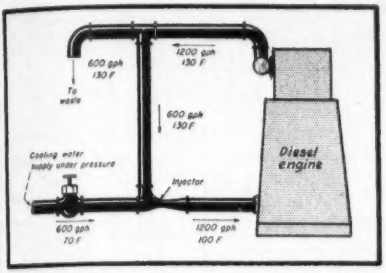
Heating for 3–4 min. is required. This relatively slow rate is necessary, because the ring, if heated too rapidly, will expand away from the spinnings and ruin the braze. Prior to heating, both spinnings are liberally coated with flux to prevent oxidation or decoloration. The silver plate remains intact.—Electronics, Ja, 111

Pakistan Industrial Plans

To encourage industrial development, Pakistan has adopted a plan to build government-owned trading estates, in areas. Three such estates are under construction at Karachi, Hyderabad (Sind), and Sukkur, and five or six more will be developed in the next 10 years.

Because of financial difficulties, factories will not be erected for tenants. Plans call only for providing land, water, power, roads, railroad sidings, telephones, and removal of waste material. In certain cases, simple buildings will be built for tenants.

Estates will range in size from 900 to 2,000 acres, with the latter having further possible expansion up to 2,000 additional acres.—Mach, N 20, 996



IMPROVES ENGINE PERFORMANCE

When cooling water comes from supply mains under pressure, recirculating part of water improves engine performance. Warmer cooling water causes more uniform expansion of parts, warmer cylinder jackets eliminate condensation in crankcase, and doubled water flow eliminates hot spots. Simple way to recirculate is to use injector that draws equal amount from supply and discharge lines.—Power, D, 134

Long-Life A-Battery for Hearing Aids

New battery, developed by National Carbon Co., has an 80-hr. life, compared with 24-hr. for other pen-cell batteries. It uses oxygen from the air as its depolarizer, thus enabling the chemical content to be devoted to electrolyte. This gives a larger power output per weight and volume.

The battery consists of two oxygen-absorbing carbon strips (positive electrode) bonded to a perforated metal strip and molded into a plastic case. Gel-paste, poured into the case, immobilizes the alkaline electrolyte, in the center of which is inserted a sheet of zinc (negative electrode).

Battery action is burning of the zinc electrode in oxygen of air entering through vents in the plastic case. Vents are sealed with a vinyl tape until battery is placed in operation. Rating is 20–80 ma.; terminal voltage into a 20-ohm load is about 1.06 volts for 75% of battery life.—Electronics, D, 172

Humidity Affects Wool Work

Humidity and temperature are becoming more important factors to spinners and weavers of wool. Cleaned, scoured wool is excessively sensitive to sudden moisture or temperature changes. As moisture content increases, yarn strength improves. Moisture also aids in condensing of ropes, increases binding of fibers, sets yarn twist, and decreases static electricity.

Without artificial humidification facilities in wool plants, yarn and cloth will dry out during weekends, causing a drop in yarn strength or streaks in colored cloth. A constant temperature of 75–80° F. and a relative humidity of 65–70% are best for processing wool into cloth.—Textile World, D, 124

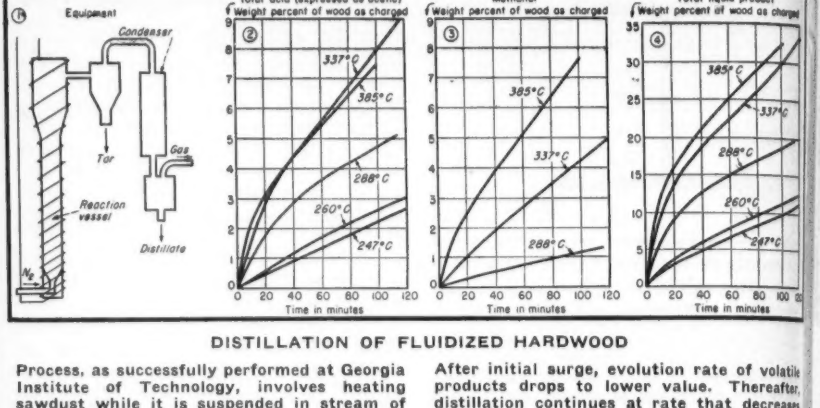
Aluminum Bascule Bridge

First aluminum-alloy bascule bridge, a double-leaf bascule 121 ft. from center to center of trunions, is in operation at Sunderland, England. Bridge carries a single railroad track, a 9-ft. roadway, and two 4¾-ft. walkways.

Upper and lower chords are built of two channels and batter plates; vertical and diagonal members are I-sections. Longitudinal girders run the full length of each leaf. Cross girders are on 3-ft. centers. Roadway floor is of aluminum-alloy plates.—Eng News-Rec, D 16, 10

Fluorescent Bus Lighting

Operation of fluorescents at high frequencies in buses operated by Chicago Motor Coach Co. results in increased lamp efficiency of 8%, use of cheaper accessory equipment, and lower installation and maintenance costs. Illumination is about 25 footcandles. Operating frequencies range from 80–500 cycles instead of the standard 60 cycles. Power source is a 150-amp. variable frequency ac. generator driven directly from the motor.—Bus Trans, D, 155



DISTILLATION OF FLUIDIZED HARDWOOD

Process, as successfully performed at Georgia Institute of Technology, involves heating sawdust while it is suspended in stream of hot non-oxidizing gas. Conventional recovery system (1) separates tar, acetic acid, methanol, and other products from outlet gas. Yields, as well as rate characteristics of process, are shown in (2), (3), and (4). After initial surge, evolution rate of volatile products drops to lower value. Thereafter, distillation continues at rate that decreases remarkably slowly. High heat-transfer rates secured in fluidized bed make it possible to heat all wood to carbonization temperature almost instantaneously. Cycle is much shorter than in ordinary kiln.—Chem Eng, D, 194

Comminuted Apple Juice Keeps Fresh-Apple Quality

Quality apple juice, of creamy texture and consistency, is now being made at a large California cannery by a new method. The juice, unlike the clear juice commonly marketed, contains solids in form of finely divided apple particles.

The key equipment unit is the Schwarz comminutor-extractor, which also can be adapted to juice extraction from other fruits and vegetables. Whole apples are fed into a chopper and moved by screw conveyor to the comminutor where they are thrown by a star wheel against breaker-ring teeth.

Chopped particles move downward and are picked up by fingers and rubbed against a cylindrical screen. Juice exudes through the screen into collecting lines. Remaining pulpy materials pass through a second pulverizing unit for final extraction.

The juice then is fed through a deaerator, pasteurizer, and homogenizer to the filler. Pomace is utilized to produce a sauce-type product or for extraction of pectin, manufacture of apple butter, for stock feeds, or for insect baits.—Food Ind, D, 92

Slope-Line Runway Lighting

Slope-line high-intensity approach lighting system has been approved by the Airport Lighting Evaluation Panel after tests on two installations. System consists of a double row of lighting units funneling out 3,000 ft. from runway. Each unit has ten 250-watt G. E. Sealed Beam aircraft landing lights mounted on a 15-ft. frame that is set at a 45° angle to the ground.

If pilot is approaching the runway at the proper angle, the units form two continuous rows terminating at the touchdown point. If approach angle is incorrect, units appear broken and at an angle to runway. A complete installation costs $50,000.—Aviation Wk, D 6, 15

High-Temperature Dyeing of Wool, Worsted Practical

Practicality of continuous dyeing of woolens and worsteds at high temperatures—possibly at 250° F.—is good, according to the American Association of Textile Chemists & Colorists. In one class of vat dyes tested with a 2–6 pH, 2-min. dyeing at 250° F. gave results equivalent to 30-min. dyeing at boil; with milling and metalized dyes, 5-min. dyeing equaled 30 min. at boil.

Diffusion, penetration, and color transfer were speeded and an increase of the order of 10 times resulted.

Advantages of high-temperature dyeing are: exhaustion can be equally as complete, fastness is as good, fiber stability is satisfactory, wide selection of colors is available, level dyeing results from more complete transfer, diffusion penetration is improved, and dyeing time decreased.

High-temperature-dyeing advantages on cotton, nylon, acetate rayon, and viscose rayon were not so pronounced as on woolens and worsteds.—Textile World, D, 118

Centrifugal Soap Process

New Sharples continuous process for making soap is based on separation of lye and caustic solution from neat soap by use of a centrifuge. It consists of counter-current contacting of fat with caustic and spent lye.

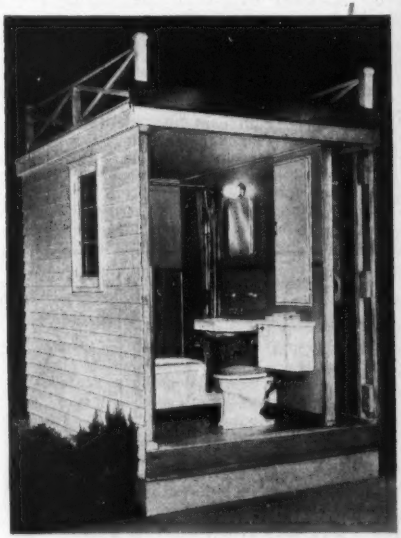
Conversion takes place in four stages: (1) initial saponification and depletion of lye; (2) completion of saponification; (3) preconditioning of fat; and (4) fitting to neat soap. Glycerine is washed from the soap at all four stages.

Neat soap is produced in less than 2 hr. Operating temperatures are less than 200° F., and pressures not higher than 40 psig.

Advantages claimed for the process are a more uniform soap, lower operating costs and steam consumption, better glycerine yield, and more soap per pound of fat because of nigre elimination.—Chem Eng, D, 107

Conveyor Samples Fruit

A machine that takes impartial samples of fruits or vegetables has been developed by the College of Agriculture, University of California. It is a concave slat conveyor with spaced openings through which samples drop. Slots are adjustable for taking from a 0.5 to an 8% sample. Placed in the packing line after the washer, the machine requires no extra handling.—Food Ind, D, W99



PREFABRICATED BATHROOM

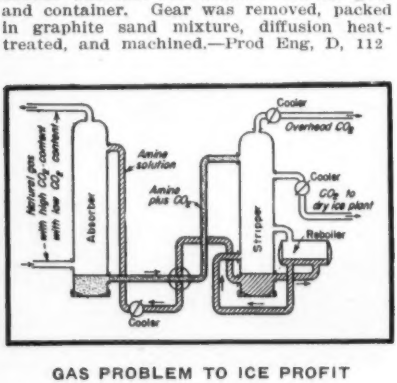
Including a tub, sink, toilet and tank, electric heater, and built-in medicine and linen closets, Builders Mfg. Co.'s bathroom is added easily to home without necessitating alteration of interior arrangement. The 7x8x8-ft. unit has frame outside and plywood finish inside. Only four connections are needed—one electric, two water, and one soil pipe. Septic tank is not included in the package.—Business Wk, D 4, 54

Technical Shorts

Acid Machining—Unusual process is cutting of thin-gage metals by acid etching. Pair of duplicate photographic negatives are registered and taped together. Copper sheet, with both sides sensitized with photographic emulsion, is slipped between negatives, exposed to light, developed, and fixed. Areas exposed to light remain coated. Etchant then attacks remaining areas. Typical products are instrument reticules and ultra-detailed cut-through elements.—Am Mach, D 16, 115

More Efficient Than Ball Mill—A laboratory crusher in tests has "ground" materials 48 to minus 325-mesh with an efficiency of 182-220% greater than ball mills grinding similar materials to similar size. Crusher will take ½-in. feed and produce minus 16-mesh in one pan.—Eng & Min J, D, 114

Doubles Gear Life—Tin shortage in Germany led to development of bronze coating of steel gears and longer gear life. Procedure was to place gear in cast-iron mold lined with fireclay and to cover with heavy iron ring. Bronze was cast into annulus between gear and container. Gear was removed, packed in graphite sand mixture, diffusion heat-treated, and machined.—Prod Eng, D, 112



GAS PROBLEM TO ICE PROFIT

Union Oil Co. has installed the Girbotol process to remove objectionable CO_2 from natural gas. Enriched monoethanolamine-water solution, flowing cold from base of absorber, is heated and passed downward through a stripper, counter-current to hot amine and water vapors. Carbon dioxide, taken off at top and lower tray position, is purified, compressed, dehydrated, liquified, and solidified. —Chem Eng, N, PPI-114

Speeds Sewer Laying—Small-diameter sewer-pipe laying can be facilitated by prejoining of three lengths with gunite. After gunite sets, lengths can be laid (one contractor using tongs suspended from a back-hoe employed for excavation). Joints in trench are joined by dry cement-mortar. One crew laid 600 ft. of pipe in an 8-hr. shift using this method.—Eng News-Rec, D 9, 76

Lifts Cab and Trailer—Both tractor and trailer are raised for maintenance at the Seattle, Wash., GMC Truck sales office by triple-post hoist equipment. Work can thus be done simultaneously. High ceilings in shop permit work on even the largest units.—Am Auto, D, 70

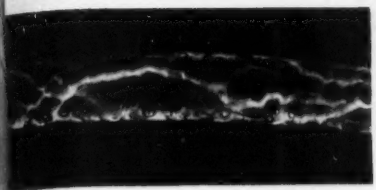
Controls Gas Odor—Standard Oil Co. of Calif. controls amount of mercaptan in natural gas by a General Electric X-ray device originally designed to measure tetraethyl lead in gasoline. Mercaptan permits detection of leaks by its odor; too much is undesirable.—Oil & Gas J, N 18, 131

Corrosion-resistant Coatings—Recently announced development by International Nickel Co. is deposition of nickel coatings on steel by chemical displacement from hot solution of nickel chloride and boric acid. Annealing then results in diffusion of nickel and iron to give corrosion-resistant surface which provides good base for organic finishes, conversion coatings, and ceramic enamels.—Steel, D 13, 91

Safety Sleeve for Glass Cutter—Similar to safety sleeves worn by welders, safety sleeve worn by Pittsburgh Plate Glass Co. employees eliminates injuries from glass splinters or cracking of glass. Grommet placed in sleeves provide added safety and aid in ventilation.—Factory, D, 127

Welding Long Tubes—North American Aviation, Inc., seam-welds tube on a standard seam welder by using a short supporting copper mandrel instead of a full-length one. Mandrel is attached to spring-loaded arm. After 18-in. length is welded, roller pressure is released, allowing spring to pull mandrel along to unwelded portion.—Weld Eng, N, 7[illegible]

Aluminum-foil Fire Suit—Made of laminated aluminum and cotton cloth, a new fireproofing suit will withstand up to 1800° F. It approaches 100% reflection of infrared rays and radiant heat. Suit weighs 8.32 lb. It is a development of the Clothing Branch, Air Material Command.—Aviation Wk, D 6, 2[illegible]



FLAME-EFFECT NEON SIGN

Eye-catching neon signs, which "flicker" in flame effect, need no special switching device. Tubes contain hollow glass beads, as well as neon gas. Beads cause current to create odd luminous patterns as it passes through gas around the edges and in hollow centers of beads.—Elec World, D 18, 114

Protects Cloth from Fork Damage—Center filling fork rising on backward movement of loom often breaks through cloth, resulting in second-grade cloth. A steel protector plate will eliminate the chance of damage. Protector plate, made from ⅛x2-in. steel the length of the breast beam, is bolted to breast beam so plate fits just under cloth. A premature rise of fork will be stopped by plate.—Textile World, D, 157

Lubricates Hoisting Rope—In a Mexican gold and silver mining operation, hoisting ropes are kept lubricated by sheaves mounted above oil pans. Sheaves are mounted in pans so that, as sheaves move in contact with rope, oil is picked up from bath and delivered to rope. Sheaves move back out of position after lubrication.—Eng & Min J, D, 110

Toward Greater Jet Safety—Tests conducted by the U. S. Navy at Patuxent, Md. indicate 2 ft. is the closest a person should come to the intake of a jet plane without danger of being sucked into the intake. One such accident has been reported.—Aviation Wk, N 29, 24

Resists Rancidity—Research by Swift & Co. shows that use of anti-oxidants in cardboard and in coating of cardboard and paper prevents rancidity in fats and fat-containing foods packaged in cartons and paper wrappers. Anti-oxidants were citric acid, pyrogallol, galacetonin, and gum guaiac.—Food Ind, D, 96

Speeds Coal Sampling — Five-compartment, exposed, steam-heated table cuts drying time for coal samples from 2 hr. to 15 min. at Hudson Coal Co. Surface moisture is driven off readily because of the enlarged heating surface. Table is used to sample pen-sized and smaller coals.—Coal Age, D, 102

Condenser Supports Turbine—During the war, some destroyer-escort vessels were built with condenser shell supporting the turbine-generator unit. This idea has been borrowed by Foster Wheeler Corp. in building a 20,000-kva. unit for a power plant. A heavy frame fits on the condenser and acts as a cradle for the turbine. The condenser is 14 by 32 ft.—Power D, 120

Fills Ladles Easier—A progressive U. S. foundry has eliminated trouble often encountered in filling ladles at cupola spout. End of spout was closed and a vertical hole made near its end. Molten metal now flows straight down in the same place every time, regardless of pressure head on the stream. Another foundry has reduced hand-ladle-lining problems by using square shells and standard split firebrick.—Foundry, D, 126

Forms Block Ice—A continuous process for making ice cakes without brine or ice cans has been developed at University of Texas. Direct-expansion freezing cylinders extrude hard white ice in 12x15-in. columns suitable for automatic cutoff into cakes. One-ton pilot-plant machine turns out 1,920 lb. in 24 hr. Equipment is cheap, labor cost is low.—Chem Eng, D, 119

Atomic Power—Key problems to commercial atomic-power generation were listed, at 1948 annual meeting of American Society of Mechanical Engineers, as: nuclear "garbage" disposal; efficient coolant for high-temperatuer heat exchangers; industrial uses for 2,000° F. by-product heat; structural material with high-heat resistance and high strength-weight ratio; and plentiful supply of uranium ore.—Elec World, D 11, 12

Measures Composite Coatings—Method developed at U. S. National Bureau of Standards determines total thickness of electrodeposited composite coatings (copper-nickel on steel) to within 10%. It involves measurement of attractive force between the plated specimen and two permanent magnets of different strengths. Values obtained, in conjunction with magnet calibration curves, determine total thickness and that of each layer.—Iron Age, D 2, 110

READER SERVICE

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Flash-Welding Nickel Steels

Research on steels containing 0.10 to 9.0% nickel showed all capable being flash-welded successfully, once proper schedules had been establi

LOW-ALLOY STEELS in which nickel is a prominent element can be flash-welded with excellent results, according to an investigation conducted by Taylor-Winfield Corp. But precautions not required for low-carbon steels must be taken.

The investigation included a 9.0% Ni steel, NE 8630, and SAE steels 2320, 3115, 4615, and 4640. Welding was done on a hydraulically operated flash welder that afforded manual as well as automatic control of the movable platen.

Initial work indicated that a comparatively high level of energy input resulted in best welds. Flashing was started by using a higher value of welding voltage, coupled with manual control of welder platen. Manual control allowed the platen to be reversed one or more times until flashing could be established easily.

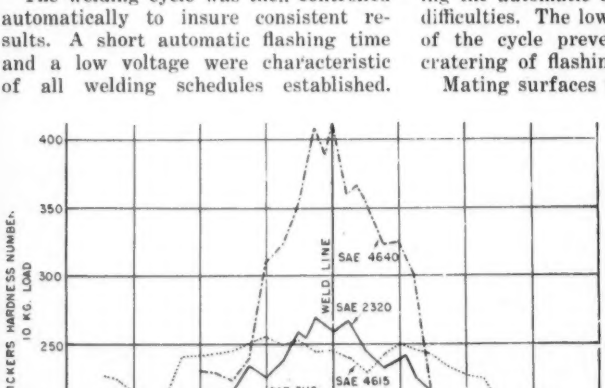
The welding cycle was then controlled automatically to insure consistent results. A short automatic flashing time and a low voltage were characteristic of all welding schedules established. They differed, however, in manual fl off time and upset dimension. The m ual time indicated degree of difficult starting the flashing.

Weldability of the steels varied judged by the ability to arrive at a s factory schedule by trial and to d cate results of a particular sche SAE 2320 and 3115 were hardes weld, being sensitive to length of a matic flashing time and to leve energy input.

SAE 4615 and 4640 were less diffi but precautions had to be observe prevent 4640 from hardening excess in the as-welded condition. NE 8630 as easy to weld as the SAE 1030 use a control.

Start of flashing cycle by manual trol was of prime importance. This cedure allows a low welding voltage ing the automatic cycle without sta difficulties. The low voltage during of the cycle prevents excessively cratering of flashing surfaces.

Mating surfaces therefore are sm



HARDNESS T of 1-in. dia. spec in as-welded con indicated a low except for SAE Actual level de on degree of air enability and qu ing rate in weld upsetting curren left on for rel long time to st heat in weld, it s l o w l y, elim danger of weld ing immediately welding.

Also, depth variation of the plastic zone across the surfaces is less, immediately prior to forging, or upsetting. These welding conditions seem necessary to make welds possessing ultimate tensile strength of the steels.—Weld Eng, D, 36

Builds Low-Cost Houses With All-Aluminum Exteriors

A Muncie, Indiana, contractor has achieved both economy and good appearance in a 52-house project by making exterior of aluminum. This includes siding, windows, and combination doors, but does not include roofs, trim, and window surrounds.

A 25% saving in cost, as compared with wood bevel siding over conventional sheathing, was made by using the aluminum siding, a product of the American Aluminum Corp. Siding has a ⅜-in. insulating board backing, which allows its application without sheathing.

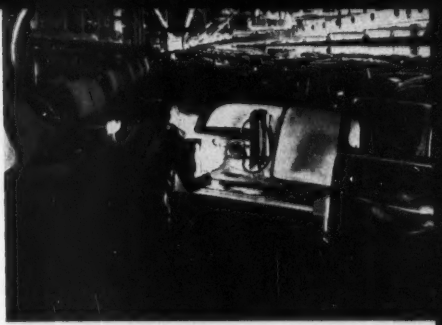
All joints are covered with a spline held rigidly in place by tension. Aluminum corner pieces, which require no nailing, assure a tight fit. Special right- and left-hand end covers are used where siding abuts windows, doors, or other openings. Siding is allowed to weather for 30 days before it is spray-painted.—Am Builder, D, 98

Promises Better Tires

Greatest advances in rubber technology in past 3 years have been the development of low-temperature synthetic rubber and of a new high-abrasion furnace-type carbon black (Philblack O of Phillips Petroleum Co.). This furnace black is claimed to be 10–20% more reinforcing in character than channel black.

Combination of the synthetic rubber and carbon black gives compounds having a higher reinforcement potential than the best prewar compounds of natural rubber and channel black.

Road tests bear out this claim in that performance of tires made of the new combination has been superior, with improvements ranging from 8 to 109% in abrasion resistance. Crack-growth resistance is good.—Oil & Gas J, D 9, 70



ELIMINATES MANUAL HANDLING

This pneumatic loader has replaced manual handling at Fisher Body in transferring front-seat units from an overhead conveyor into a Chevrolet. Two or three men were required previously; now one man is needed. Loader can pivot 180° and can be moved back and forth between seat conveyor line and body line.—Factory, D, 128

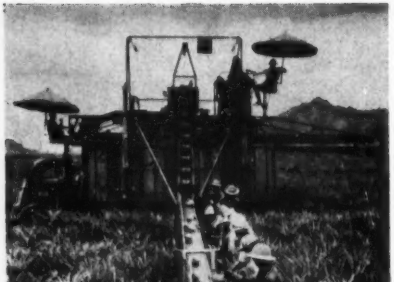
New Frozen Food Package

Seabrook Farms frozen foods are now being packaged in a container that requires neither a liner nor an overwrap. Package is a simple, low-cost, single-ply folding carton that can be set up, filled, and sealed in one operation.

A wax-resin-polymer combination coating gives the carton necessary water-vapor retention. Board is conventional white patent-coated, manila backed. The patented coating provides a good heat seal in place of glue in setting up and sealing.—Mod Packaging, D, 104

Interoffice Television

Remington Rand has started production of its portable interoffice television system, called Vericon. Commercial version does not broadcast but transmits the image by coaxial cables. Composed of three units—camera, power generator, and master viewer—as many as 10 viewers can be connected to the camera. —Business Wk, D 11, 54



MECHANIZED HARVESTING

Harvesting on Hawaiian Pineapple Co.'s plantations has been revolutionized in last 2 years. New harvester has 50-ft. lateral boom carrying belt conveyor and is mounted on open frame large enough to admit truck and bin between its legs. Harvester is then lowered onto bin by hydraulic jacks in its legs. Pineapples are carried to bin by conveyor. Bin is transferred by Ross straddle truck to semi-trailers for trucking to cannery.—Food Ind, D, 75

Produces High-Quality Spool

High-quality spools at lower cost and less work are produced on an electro-pneumatic warp spooler developed by Davis & Furber Machine Co. Up to 40% more yarn of certain types can be wound onto spools because of pneumatic compression. Firm, even pressure is applied where yarn enters spool, eliminating slackening. Pressure can be regulated.

Creel contains 48 large spools, 24 having live ends. Remaining are reserve packages tied in tandem to tails of live ends. Two electronic stop motions help build spools. First one, at creel, cuts out much rewinding of broken ends, as machine is stopped before ends run up on spool. Second stop motion, between measuring roll and spool, stops machine if end becames slack.—Textile World, D, 143

New Manufactured-Gas Method Uses Heavier Oil

American Gas Association has announced a new method of making manufactured gas of heat content equivalent to natural gas. Only low-cost, heavy oils are needed.

The process makes possible a 30% or more reduction in cost of materials and an increase of 35% in thermal capacity of existing equipment. The coke deposit, which fouls generators in present oil-gas processes, is burned off during the gas-making period. It thus supplies a good portion of heat needed to gasify the heavy oil without requiring additional time.

Using converted units of former water-gas sets, Consolidated Gas Electric Light & Power Co. of Baltimore produced 6-million cu. ft. of 1,000-Btu. gas per day from a single unit with premium oil costing 12¢ per gal. With a lower-grade Bunker C oil costing 6½¢ per gal. the same unit produced 5-million cu. ft. per day.

Apparatus employed in the new process can be made at 50–60% of the cost of conventional water-gas equipment.—Oil & Gas J, D 2, 125

Adapt Units for Soil-Cement

Griffith Co. adapted much of its road-making equipment for a soil-cement road-building job in California. Roadway was given a rough grade before forms were placed; disking and harrowing followed. Final preparation was a furrow plowed along center of roadway. Cement was dumped into furrow by a modified hopper-bottom dump truck. Discharge mechanism is geared to wheels so cement is placed only when truck is moving. Cement ran 3.3%.

Roadmixer was modified to handle water instead of asphalt. Rolling was done with tandem rollers, drum replaced by truck tires.—Cons Meth, D, 45

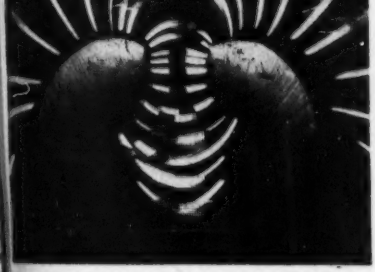
Capacitors Improve Power Factor and Reduce Costs

Most industrial plants operate at a power factor less than unity. One practical method to improve lagging power factor is use of a shunt capacitor, which supplies the magnetizing component of the current.

Capacitor size depends on reason for use. If it is to correct power factor only, an electric-circuit solution provides capacitor-bank rating. But more study is needed if the application is primarily to reduce the power bill.

Consumption rates throughout a typical week must be analyzed to establish the minimum size of bank that is most effective in reducing kilovolt-ampere-reactive (kvar.) demand. Other information needed is: rate schedule; load requirements including representative kva. and power factor during the week; distribution circuit losses in the plant; and fixed charges and installation costs for equipment selected, converted to the same period chosen for energy and loss evaluation.

By using this information, advantage offered by a particular number of capacitors appears as the difference between power-cost reduction and charges for new equipment. By determining this difference throughout a range of installed capacitive kvar., the most effective installation can be selected.—Power, D, 123



TUBE MAPS MAGNETIC FIELDS

Paths of magnetic lines of flux can be traced with a mercury vapor diode tube having perforated tantalum anode and coaxial cathode. Electrons in tube are focused into tight helical beams following flux paths, then made visible by vapor ionization. Field is mapped by successively exposing photographic film in darkened room as tube is moved about a magnet. Lights are then turned on to photograph magnet itself.—Electronics, D, 124

Aluminum Good Mine Cable

Shortages of copper wire immediately after the war turned coal mine operators to use of aluminum cable for feeder and borehole use. Now cost and weight advantages of the aluminum have convinced 15 Alabama operators to use the new cable throughout their operations. Rated carrying capacity of aluminum is 84% that of copper of the same size and insulation type.

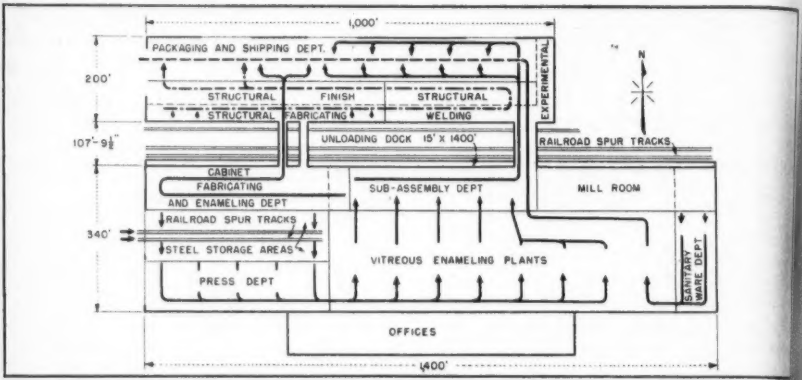
Size for size weight of neoprene-insulated Type RH aluminum cable is ½–⅓ as heavy as rubber- and double-braid insulated copper cable. Comparing size with equivalent voltage drop, weight saving is about 40–50%. Cost savings range ½–⅓.—Coal Age, N, 84

Disassembly Line for Store

Thalhimer Bros., Inc., department store has installed a $70,000 mechanized disassembly line to handle, check, and mark incoming merchandise. Now merchandise moves only 697 ft. instead of 1,297 ft. from dock to sales floor; packages are handled 17 times instead of 23. Work area is increased 30%, dock area 810%.

Packages received at dock are raised to fifth-floor receiving and marking room by lift. There, gravity rollers and power conveyors move cartons until final destination is reached. Price tags are made out in advance. Markers control conveyor speed past their stations by knee-switches.—Business Wk, D 18, 78

Production Flows . . .

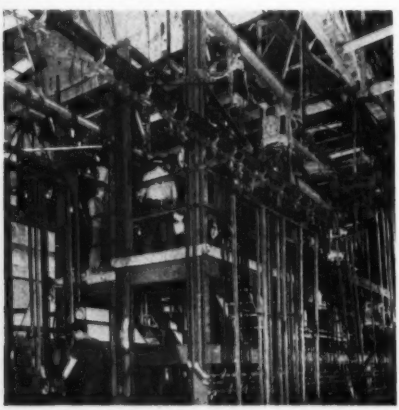


. . . along nearly 6 miles of both overhead and shoulder-height conveyors in Lustron Corp.'s assembly-line plant, geared to make, from porcelain-enameled steel, . . .

150 Prefabricated Houses a Day

Hope to sell for $8,000, exclusive of lot and landscaping, within 50 mi. of plant. House is packaged for shipping.—Eng. News-Record, N 25, 4

Wall Sections . . .

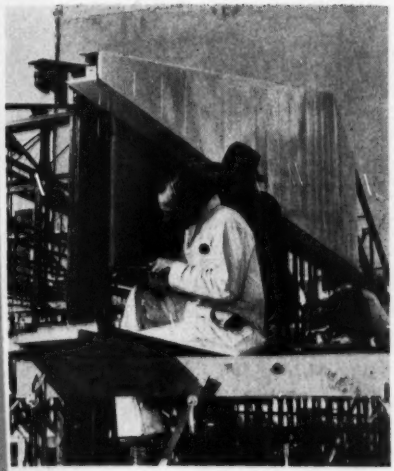


. . . are formed by welding light-gage steel members. Trusses are fabricated in two sections on three-level jigs. Plant was formerly used for aircraft production.

Exterior Panels . . .

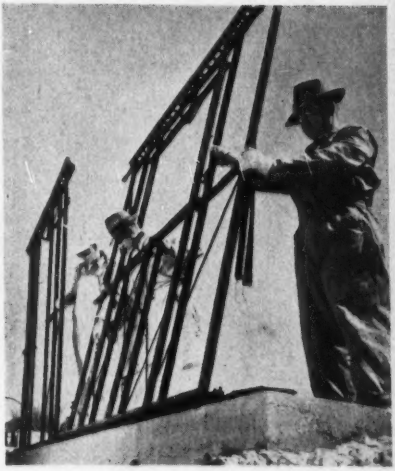
. . . for both interior and exterior walls are porcelain-enameled. Interior panels are 4 ft. wide, 8 ft. high; exterior panels are 2x2 ft.; ceilings panels are 4x4 ft.

Wall Frames . . .



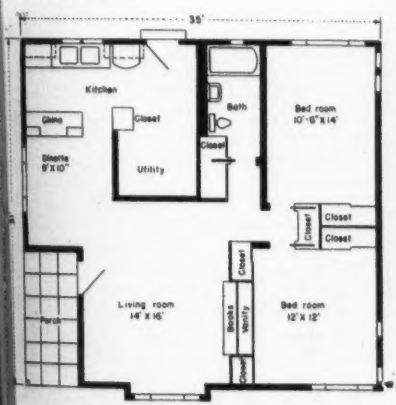
. . . are packaged on the trailer to be the first units off at the site. Framing is 20-gage cold-rolled steel. Joists are 2 ft. apart. Frames are bolted to foundation.

Panel Facings . . .



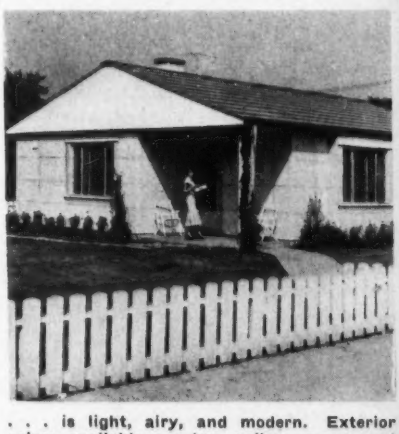
. . . are of 20-gage cold-rolled steel also. Both inside and outside panels are bolted to frames and trusses. Joints are later calked for water-proofing.

Floor Plan . . .

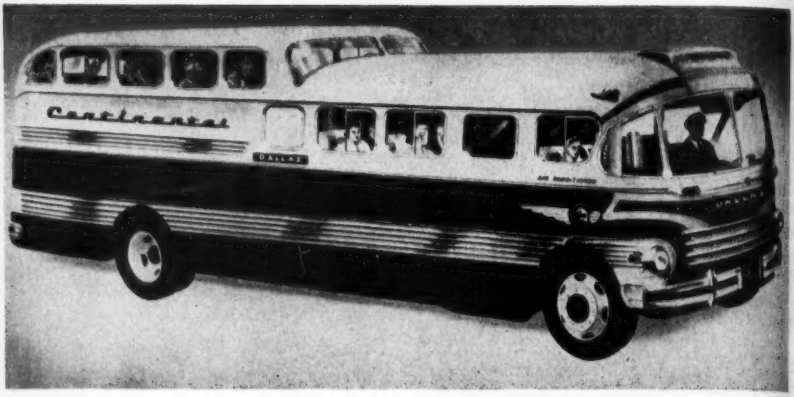


. . . shows extensive use of built-ins. Oil- or gas-fired radiant heating system, with pipes in the ceiling, is used. Completed units do not include a garage.

Completed House . . .



. . . is light, airy, and modern. Exterior colors available are tan, yellow, green, and turquoise. Interior colors are more variable. Foundation is a concrete slab.



DECK-AND-A-HALF BUS

Double normal baggage space, a total of 410 cu. ft., is provided in Continental Bus System's new "Continental" by a raised passenger deck seating 21 persons. Bus capacity is 35. Bus is air-conditioned and includes a lounge and fold-away toilet facilities. Body is constructed of aluminum for weight saving. Wheels are same.—Bus Trans, D, 57

Standard Palletized Loads Save On Handling Costs

After completion of cost studies, Westinghouse Electric's West Springfield Works found that raw materials and vendor processed panels could be handled at a saving if received in standard palletized lots. Present handling costs per ton of incoming materials—including carload and lcl. lots, parcel post, and express—is $1.83, a saving of $0.61 per ton handled. To institute the indicated program, cooperation of suppliers was needed and obtained.

Zinc-alloy ingots are received on zinc pallets in 2,000-lb. units. It costs $4 to unload a carload of palletized zinc, a saving of $48 per carload. Steel is now received in gondola cars in 4,000-lb. bundles. It takes only 3 hr. to unload a car; the saving is 60%. Vendor panels are shipped 100 panels to the crate or in palleted bundles of 2,000 lb. Unloading costs previously were $45 per truck when shipped loose; it now costs $3 per truck.

If materials are to be long-hauled from receiving, trucks are loaded and held until six-truck trains can be formed. The six trucks can be delivered in only a fraction more time than a single fork-lift truck load.—Factory, D, 108

Smaller Electronic Gear

U. S. Army Air Force is working on a miniaturization program for airborne equipment with the objective of reducing electronic gear to 20% of present size, but without impairing performance.

Tubes are being redesigned and same characteristics are being obtained in 80% less space for amplifiers and 90% less space for rectifiers. Size and weight of transformers have been reduced to a third of previous values.

Printed radio circuits are reducing sizes of low-level circuits. Parts in high level circuits are being grouped more compactly by use of liquid Freon for cooling. Equipment also is protected from atmospheric effects and is less subject to burnouts.—Electronics, D, 17

Magnesium-Bisulphite Pulp Process Important Advance

New pulp mill of Weyerhaeuser Timber Co. uses magnesium oxide, instead of lime, as base of cooking acid employed in digesters.

Entire mill effluent is evaporated and burned. Residual magnesium-oxide dust and sulphur dioxide are combined into a strong raw acid for reuse in cooking of wood chips. Thus, all waste liquor is used. Also, heat energy is produced to supply power for the mill.

This system is comparable to cyclic recovery systems employed in soda and sulphate pulp processes. Its development may have tremendous implications for the future of the sulphite pulp industry.—Chem Eng, D, 74

Bulldozer Speeds Exploration

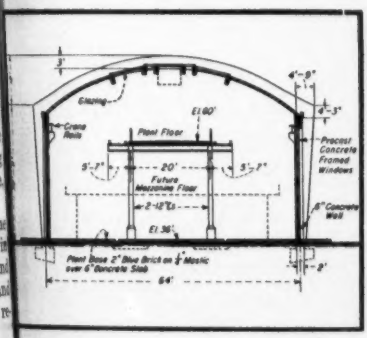
Bulldozers have replaced surface prospecting and search for hidden outcroppings of scheelite ore bodies at Nevada-Massachusetts Co. Both prospecting costs and time have been reduced. Prospecting procedure is to cut across formations selected from geologic maps by downhill trenches with bulldozers. Openings are examined by ultraviolet light.

Outcrops are covered by 3–5 ft. of overburden, bulldozers sometimes digging to depths of 15 ft. In most cases, 'dozers can work independently of roads. If ore is found, roads are built.—Eng & Min J, D, 81

Infrared Drier Oil Fired

What is believed to be the world's first oil-fired infrared drying oven has been installed at Union Can Co., Australia. Built by Major Furnace & Combustion Engineers Pty., Ltd., it has a black sheet-steel panel heated by hot combustion gases.

Infrared radiation is emitted by the black sheet in all directions. There are no focal zones of maximum heat concentration or cold spots. Internal diameter of oven is smaller than would be required in an electric oven of same capacity.—Food Ind, D, 157



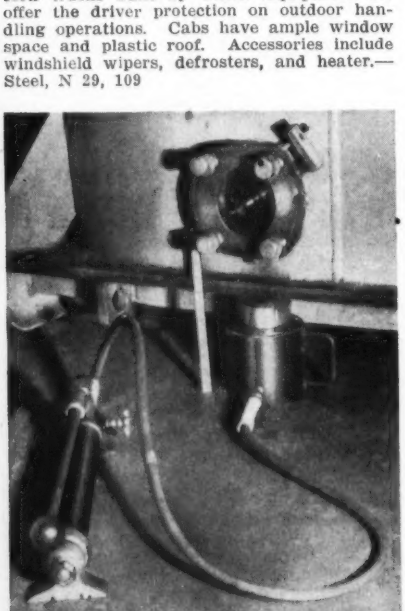
EXPOSED FRAME USED FOR CHEMICAL PLANT

...rel arch shell roof and rigid frame on ...exterior give this Essex, England, chem... plant good freedom of arrangement ...in the plant. Building is 144x64 ft. The ...n. thick reinforced-concrete roof gains ...ness from rigid frame. Longitudinal ...ns carry skylights and support remov... able flat slabs for upward plant expansion. Operating floor is reinforced concrete on a structural steel framework. Two 5-ton traveling cranes operate on rails parallel to walls. Exterior walls are reinforced concrete with windows extending almost full height of walls.—Eng News-Rec, N 25, 47

New Products

Mechanical Concrete Key—Need for steel hangers, channels, and metal lathing is eliminated in anchoring plaster to concrete with a new device invented by R. M. James. Elastic knobs of a rubbery plastic material are nailed or bolted 6 in. apart to forms into which concrete is poured. When forms are removed, niches remain in concrete into which plaster will flow, forming a permanent joint when dry.—Eng News-Rec, D 9, 126

Protects Operator—Weather-tight cabs for fork trucks built by Clark Equipment Co. offer the driver protection on outdoor handling operations. Cabs have ample window space and plastic roof. Accessories include windshield wipers, defrosters, and heater.—Steel, N 29, 109



SMALL-CLEARANCE JACKS

Hydraulic jack, built by Bonneville Power Administration shops, requires only 5½-in. clearance. Intended especially for lifting transformers on flat-car beds, it has a capacity of 50 tons through a 3½-in. lift. Operation is by a hydraulic hand pump.—Elec World, N 20, 110

Air Valve for Turbojet—Serving as an on-o valve in cabin air-conditioning system wing and empennage anti-icing system, In dustrial Design Lab.'s new air valve moderates air flow. Leakage rate is le than 0.15 lb. per min.; unit has a pressu range of 0-140 psig. and a temperature ra of −65 to 500° F.—Aviation Wk, N 29,

Bus Radio Receiver—Fixed-tuned, fm. ceiver is announced by General Electric for use in buses or other vehicles. Cry controlled at desired station frequency, used with a dipole mounted externally o driver's seat.—Electronics, D, 130

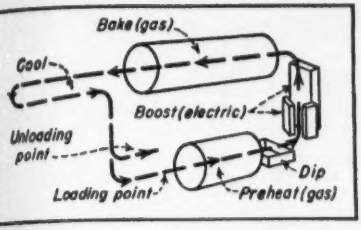
Space Heater—Warm-air space heater, signed for easy convertibility of fuel (c gas, or oil), is available in two sizes—1 and 1½-million Btu. per hr. Offered Dravo Corp., it can be used with or wit ducts and is applicable to summer vent ing, process drying, and curing.—Found D, 251

Truck Draws Dies from Presses—Equip with a heavy-duty, 2-speed hydraulic h pump and winch, Lyon-Raymond Corp.'s high-lift truck draws 1,000- to 3,000-lb. d from presses. Platform elevation ra from 6-54 in. Removable boom adapts for stacking, tiering, and other materi handling operations. Truck weighs 1 lb., is 83 in. long.—Ind Dist, D, 120

Freight Car for Flour—General Amer Transport Corp. is road-testing its freight car built for bulk shipment of f Called Trans-Flo car, it is suitable for s ment of other powdered materials, incl plastic molding powders and chemi Powders are kept completely uncontamin —Business Wk, D 4, 93

Single-unit Furnace Control—New unit double duty as air limit and fan co Range of air-limit control is 100-200° with 10° differential. Ratings of this C Stat, Inc.'s, control are 1,500 va., ¼ hp., 125 va. pilot duty at 120-240 v.—Elec D, 103

Filters Water—Magneswitch, Inc.'s, ridge-type water filter meets need fo fective water conditioning at point of as fountains or taps. Mineral cartrid in. in dia. and 13 in. long, fits into cy having bolted end cap and ¼-in. pipe nections at top and bottom. Filter al use on syrup mixing units where ch taste is objectionable—Prod Eng, D, 1



SPEEDS ARMATURE IMPREGNATION

Hoover, Ltd., at Perivale, England, has reduced armature impregnation time from 13¼ to 2¾ hr. Features of new method are preheat temperature above boiling point of varnish solvent, means of revolving armatures, infrared lamps to restore heat lost in dip, and gas-fired radiant heat ovens. Armatures are revolved on double-chain conveyor by knurled rollers on outer ends bearing against track alongside of conveyor chains.—Mach, D 11, 1063

Bearing for Wet or Dry Use—Anagra Co. has developed a new bearing material that is self-lubricating, high-strength, low-friction, and chemically inert. Material is well suited for use in dry jigs, continuous washers, and leaching equipment. Permanent graphitic lubrication also makes bearings useful in dry applications where wet lubricants cannot be used, such as in bake ovens, dryers, and mangles.—Textile World, D, 144

Records Bottom Profile—Weighing but 40 lb. and measuring 14½x20½x8¾ in., a new depth recorder has a range of 100 fathoms. Unit produces instantaneously a profile of the ocean's bottom. It is a development of Pacific Div., Bendix Aviation Corp.—Marine Engrg & Ship Rev, N, 126

Steams by Jet—Intended for fast cleaning of heat-exchanger bundles, cooling coils, and other types of processing equipment, Seller Injector Corp.'s cleaner has 50-gal. detergent tank and 50-ft. hose. Only connections needed are to steam and water lines.—Oil & Gas J, N 18, 127

Machines Long Work—Length of work, which can be turned to various diameters, tapers, and forms, has no limitation with two types of Turnomats developed by Karge & Son Machine Co. Device is essentially a self-contained screw machine that is put into lathe tailpost or fastened to compound so stock can be driven by power. Accuracy of diameter and step length is normally ±0.001 in. Capacities run up to 1½-in. dia.—Am Mach, D 16, 141

Perforated Sheet Filter—A metallic filter medium, announced by W. S. Rockwell Co., is made of two sheets perforated with 0.045-in. dia. holes, 120 per sq. in. Sheets are aligned so holes are staggered with edges close together. Solids from liquid passing through holes and between sheets are retained on top sheet. A filter bed may also be placed over top sheet to retain finer particles.—Food Ind, D, 172

Versatile Paint—Stephenson Air Brush Paint Co.'s RMS Perma-Dri is recommended for acoustical treatment, anti-sweat protection, and insulation. It contains heat-processed minerals and waterproof adhesive binder, and can be sprayed in thicknesses of over ½ in. Perlite granules are applied over Perma-Dri.—Am Builder, D, 112

Reversing Contactor—Intermittent duty reversing contactor, announced by Square D Co., has double magnet frames and contact blocks with two 3-pole armature assemblies mechanically locked. It is suitable for use with ac. polyphase motors rated up to 1 hp. and ac. single-phase or dc. motors up to ¾ hp.—Elec World, D 4, 128

Handles Drums Easily—Twin pushers on Automatic Transfer Co.'s electric fork-lift truck simplifies handling of metal drums. Pushers operate singly or together. Rams are hydraulically powered and are pushbutton-controlled.—Factory, D, 138

No Nails in Scaffolding—Need for nails, spikes, or bolts in wooden scaffolding is eliminated by using Knife-Grip Product Co. scaffolding connectors. Connectors hold scaffolding level, eliminate cross bracing, and do not damage lumber. Connectors can be affixed by unskilled labor.—Eng News-Rec, D 2, 18

Car Tow, Jack Combination—Sparks-Withington Co.'s new hydraulic towing unit can also be used as an auxiliary jack for garage use. Unit can be hooked to any standard bumper of automobile or light truck. Lift on top rail slides back on lower rail for positioning. When car is jacked up, top rail slides forward again to towing position. It is also handy for lubrication work, brake adjustment, and tire changing.—Am Auto, D, 86

Engine-driven Welder—Dc. welder, powered by air-cooled engine, has been announced by General Electric Co. Weight is 660 lb. for minimum of 250-amp. current. Welder has built-in auxiliary power outlet of 110 v. for operation of lights and power tools. It can be furnished on two-wheeled, pneumatic-tired trailer with standard 62-in. track.—Weld Eng, D, 82

New Products

Lifts Lift Trucks—Servicing time on fork lift trucks, industrial trailers, and platform trucks is reduced with Service Caster & Truck Corp.'s new hydraulic lift. Built in 6,000- and 12,000-lb. capacities, unit's safety features include hooks that lock to legs of platform at any point of elevation and pipes that drop to floor once proper elevation has been reached.—Business Wk, N 27, 62

Multi-pen Recorder—One to six different records on one circular chart are made by Foxboro Co.'s new recorder. It has only one measuring system, but a switching unit brings varicolored pens into recording position at 6-sec. intervals in any sequence desired.—Power, D, 178

Portable Infra-red Oven—Instant-Shape, a portable oven, dries any shape article as each row of lamps is adjustable and entire assembly can be shaped to obtain best efficiency. Developed by Wil-Son Mfg. Co., units are mounted on castered standards and are available in sizes from 3 to 10 rows.—Iron Age, N 25, 101

Small Snow Plow — Single-wheeled power snow plow, developed by Rototiller, Inc., blows snow 15-20 ft. clear of path. Reverse wedge scoop funnels snow into blower fan. Snow can be blown either to the right or left. Path is 3 ft. wide. Controls are on handlebars.—Cons Meth, D, 107

Plasticizer Oil—Socony-Vacuum Oil Co. is offering a highly efficient plasticizing oil for natural and synthetic rubber compounds. Called S/V Sovaloid A Special, it has no effect on cure, imparts excellent aging properties, and provides good filler dispersion.—Chem Eng, D, 174

Splices Hold Grease—Reliable Electric Co. has filled its straightline splices with a neutral grease. This prevents corrosion and decreases friction between backs of jaws and splice tube.—Elec West, N, 44

New Tire Chains—Made of high-tensile rubber and steel ice-cleets, a new tire chain for winter driving fits over tire easily and is affixed over wheel flange by screw lock. Set of four costs $10. They were developed by Birma Mfg. Co.—Science Ill, Ja, 73

Wound-core Transformer — Wound transformer core structure is for use with radio transmitters and in power distribution, neon signs, and rectifiers. Elcor, Inc.'s, unit has low core loss, credited to annealing and the preference that flux has for direction in which steel is rolled.—Elec World, D 18, 127

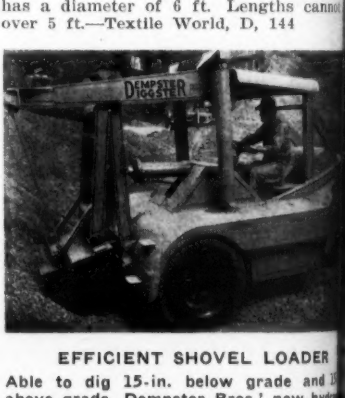
Underground Angledozer—Electrically driven Central Mine Supply Co.'s underground angledozer can be operated in only 31-in. vertical clearance. Unit is 7 ft. long; it has a 6-ft. turning radius. Three forward and one reverse speeds are available. Tilting front axle and front-wheel steering speed maneuvering.—Coal Age, D, 186

Tamperproof Drum Seal—Drums are made leak- and tamper-proof with a McDowell Mfg. Co. seal. Seal must be completely destroyed before drum plug can be removed. Synthetic gasket on flange can be reused.—Mod Packaging, D, 156.

Fuel Shut-off Valve—High capacity and controlled actuation are featured in Saval, Inc.'s new motor-operated fuel shut-off valve. It permits rapid inflight or single-point refueling of planes. Working pressure is 60 psi; weight is 5 lb. 7 oz.—Aviation Wk, D 6

Press Takes Gooseneck Punch—Offered by Cleveland Crane and Engrg. Co., new Steelweld bending press is designed to take special large gooseneck punch and has a stroke height of 30 in. An extension brings stroke height to 16 in. to allow use of standard dies. Capacity is 500 tons; bed length is 20½ ft.—Am Mach, D 2, 132

Roll-handling Truck—Of welded steel and 8-in. dia. steel rubber-tired wheels, new heavy-duty roll-handling truck for large or small cloth rolls has been introduced by Iron Bound Box & Lumber Co. Truck bed has a diameter of 6 ft. Lengths cannot be over 5 ft.—Textile World, D, 144



EFFICIENT SHOVEL LOADER

Able to dig 15-in. below grade and 1[illegible] above grade, Dempster Bros.' new hydro crowd-and-hoist shovel loader can complete most excavation jobs unassisted. Rubber tires give unit truck speeds on roads. Digging and loading cycle takes 5 sec.—News-Rec, N 25, 86

Detects Lead in Air—Lead in quantities as low as 1 part in 20-million can be detected with a mobile unit developed by E. I. du Pont de Nemours & Co., Inc. Air is passed over a spark, the light generated by spark being broken up by a quartz spectrograph. This light is passed through a Geiger counter producing electric current. Current is a measure of lead content in the air.—Business Wk, N 13, 64

Rotary Vacuum Driers—F. J. Stokes Machine Co.'s driers are available in nine sizes from 1 to 600 cu. ft. Spiral-type agitator assures maximum mixing action and complete discharge. Features include inverted reflux-ing-type dust filters, rotary-type vacuum seals, and quick-opening discharge doors.—Prod Ind, D, 174

Detects Metal—M-Scope, conveyor-belt indicator developed by Fisher Research Laboratory, Inc., detects metal objects on conveyor belts and automatically interrupts power circuit to stop the line. Loop antennas adjust for loads of different heights and widths.—Electronics, D, 205

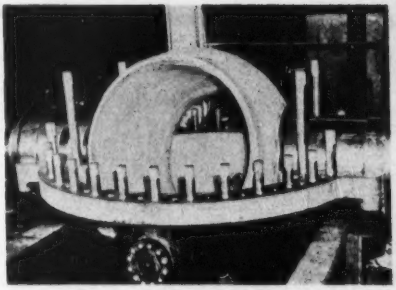
Four-coil Transformer Welder—National Cylinder Gas Co.'s Sureweld ac. welder has 4-coil transformer with movable magnetic shunt and correct ratio of open circuit to arc voltage. Transformer controls flux diversion so output current is varied as required. Welder is available in 12 models, 7 heavy duty and 5 light duty.—Weld Eng, N, 75

Baseboard Heater—Wesix Electric Heater Co.'s baseboard heater is 5 in. high by 1⅜ in. from the stud. Capacity is 105 w. per linear ft., sufficient to heat average size insulated house to design temperature difference of 70°F.—Elec C&M, N, 139

Lettering Machine—Stainless-steel instrument will operate on any drawing board. Circle indexing is simplified by use of micrometric quadrant that allows indexing of every 2° by flipping the adjusting screw into desired setting. It is an Emmert Mfg. Co. development.—Prod Eng, D, 172

Stoneware Vacuum Pump—Rotary-seal chemical stoneware pump, made by General Ceramics & Steatite Co., is particularly suited for handling wet chlorine and related products. It can use any type sealing liquid or gas, except hydrofluoric acid and caustic solutions.—Chem Eng, D, 146

Hydro-sheave Drive—Twin Disc Clutch Co. has developed a small hydraulic coupling with a V-belt sheave as a hydraulic-converter unit for motors and engines in ¾- to 5-hp. range. Possibly applications include cranes, hoists, conveyors, fans, compressors, and blowers.—Power, D, 144



VALVE LIMITS FRICTION LOSS

New type valve, developed by Pelton Water Wheel Co., is a spherical plug having cylindrical passageway of same diameter as penstock. It limits friction loss when in open position to that of equal section of straight penstock. Operating mechanism consists of two servomotors, each connected to lever at each end of valve shaft. Water from penstock actuates servomotor cylinders. Plug rotates through 90°.—Elec West, N, 75

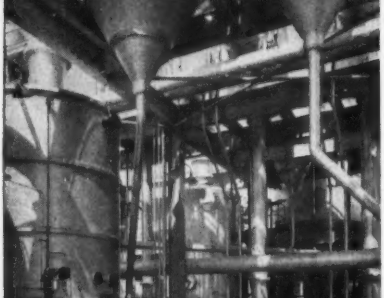
Polishes 40 Bobbins per Min.—Repeated polishing of bobbins on J. M. Nash Co.'s bobbin polisher does not remove original coating from quill and does not reduce quill life. Polisher handles 20-40 bobbins per min.—Textile World, D, 150

Push-and-pull Jack—Designed for heavy work in oil fields and other industries, the jack is adjusted in or out by ratchet handle on center screw. Lugs on pusher ends offer firm hold for chain on pulling jobs. It is a development of Templeton, Kenly & Co.—Oil & Gas J, D 16, 117

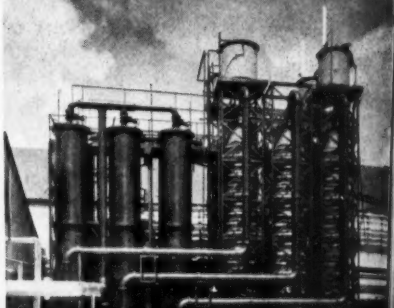
Demineralizes Water—Cartridge-type demineralizer for use in metal-finishing plants converts tap water to equivalent of distilled water by passing it through four beds of ion-exchange resins. Sulphates, carbonates, chlorides, and various metals are removed by this Penfield Mfg. Co., Inc., development.—Iron Age, D 9, 119

FREE SERVICE TO READERS

As a special service to our subscribers, McGraw-Hill Digest will furnish, without any charge, additional information about any new product or technical development described. Address your letter to: The Editor, the McGraw-Hill Digest, 330 West 42nd St., New York 18, N. Y., U. S. A. ***—THE EDITORS***



CAUSTIC SODA is recovered from cell liquor by passing it through two evaporation stages —first a double-effect, then this single-effect evaporator



CHLORINE GAS from electrolytic cells is cooled and then passed through these three ceramic and three cast-iron drying towers containing sulphuric acid

Chlorine-Caustic Soda Plant

New electrolytic installation has many advantages over conventional plants of its kind, having the latest plant and process improvements

NEW CHLORINE-CAUSTIC plant of Diamond Alkali Co. in Texas embodies the latest improvements in equipment and processing methods. The unit, with a rated capacity of 220 tons of chlorine per 24-hr. day, is also producing 50 and 73% caustic-soda solutions and hydrochloric acid. It soon will be making solid, ground, and flaked caustic and, sometime in the future, chlorinated organics.

Features of the new plant include (1) cheap, abundant natural gas for power and steam; (2) proximity to salt in large quantities; (3) dissolving of salt underground and pumping the brine to the plant; (4) dual system of equipment to avoid complete shutdown; (5) improved brine-purification and chlorine-liquefaction methods; and (6) a better method of producing caustic.

Centrifugal pumps move the brine 17 mi. to the plant. Calcium and magnesium salts are removed by a mixture of sodium carbonate and sodium hydroxide. Brine is filtered and passes to a preheater where its temperature is raised to 160–190° F.

Next it goes to saturation tanks, in which it is contacted with a salt slurry and then is preheated to 210° F. to prevent settling of salt in cell lines. After neutralization with hydrochloric acid, the brine goes to the electrolytic cells.

Chlorine leaving the cell room at 180° F. is saturated with water vapor. First it is cooled to 60° F. in water coolers, then dried in three ceramic towers, each 4 ft. in dia. and 30 ft. high, and in three cast-iron towers, using sulphuric acid. Dry chlorine is compressed to 40–45 psig and scrubbed to remove remaining

traces of sulphuric acid and organic matter.

The chlorine then enters an unusual liquefaction system which eliminates use of calcium-chloride brine generally employed by the industry. Instead, the gas is chilled and liquefied by direct heat transfer to liquid Freon vaporizing on the outside of exchanger tubes.

Part of the chlorine is utilized to make hydrochloric acid. Gas from recompression system is combined in a furnace with hydrogen from electrolytic cells. Combustion products are cooled and passed through an absorber to storage.

Meanwhile, cautic soda is recovered from cell liquor. First evaporation in a double-effect evaporator concentrates liquor from 11 to 25% NaOH, and the second in single-effect evaporator raises concentration to 50%. The caustic is cooled to 100° F., bleached, and cooled again to 60°F.

Then it is pumped to Vallez filters to remove precipitated salt crystals. The caustic, now containing 1% NaCl, is pumped to storage. Some caustic is further concentrated to 73% strength.—Chem Eng, D, 112 and 136

Reduces Production Costs

Conversion of 249 flat-top card machines in a cotton mill from group drive to individual motor drive has resulted in elimination of shaft maintenance, belt replacements, and excessive shutdowns because of motor failures on shafts.

Moreover, individual drives have eliminated variation in card speed, product waste caused by static and dirt from belts, and a serious personnel hazard. Both operating and working conditions have improved; and greater inflexibility can be exercised in arranging card machines, thereby facilitating the servicing of cans and picker laps.

Individual drives will pay for themselves in 10–12 years through savings in shaft maintenance and belt replacements.—Elec World, D 5, 124

Welds Tungsten Wire

Design of United Electronics Co.'s "beam tetrode" power tube called for tungsten Z-shaped filament leads with arms exactly parallel and at a precise distance from each other.

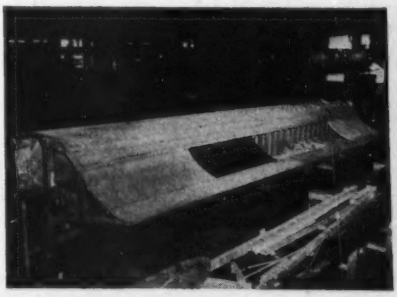
Its extremely high melting point makes tungsten the most difficult of all metals to weld. But finally it was found that K Monel metal would flow freely, wet tungsten well, and make a strong, smooth joint.

Procedure is to place a tiny eyelet of K Monel around the end of one wire and then to mount both in a fixture. The fixture is raised into a hydrogen-filled glass bell, where wires are joined with a carbon arc.—Weld Eng, D, 60

Wing Uses Boundary Suction

"Tadpole" wing, developed by the Australian Council for Scientific & Industrial Research, has proved successful on flight tests with a 6-passenger glider. The wooden airfoil has suction slots at base of the first curve at top of wing where laminar flow would normally break away from wing.

Developers believe wing will prove suitable for all-wing craft since thickness lends itself to housing crew and equipment.—Aviation Wk, D 13, 25



CENTER SECTION shows thickness of "tadpole" wing. Trailing edge has removable doors.

FURNACE WELDING FIXTURE

Landing-gear fittings are manufactured at National Supply Co. by machining their five sections, tack welding in a jig, and arc welding in an adjustable, articulated electric furnace as shown. This fixture is for complicated assemblies, preheats work evenly without developing uneven heat stresses, and holds work at correct temperature throughout welding operation. Current is adjusted by pedal to compensate for varying metal thicknesses or different welding position.—Weld Eng, D, 40

Shaft Mucking With Scraper

Republic Steel Corp. is deepening one of its shafts by mucking broken rock by slushing with a scraper. Shaft, cross section 10 x 30 ft., is being driven at an angle of −33°30′ in hard granite rock.

Three tracks and a manway run the entire length, the center track being used for ore hoisting in 20-ton skips and is kept within 50 ft. of face. Scraper slide is longer than standard to keep vertical angle of inclined approach from shaft bottom to where scraper dumps to skip under 40°. This cuts 25% from scraping time. Digging angle of scraper is 55°.—Eng & Min J, D, 92

Pottery Factory Roofed With Pumice Concrete Slabs

A half-million sq. ft. roof of hollow pumice concrete slab units has recently been placed on American Radiator & Standard Sanitary Corp.'s new California pottery plant. Various sizes of slabs were used, each designed to fit the saw toothed-, pitched-, or flat-roofed sections. Most of them were 4 in. thick, 10 ft. long, and 2 ft. 5¼ in. wide. Eight 2⅝-in. dia. holes extend the length of the slab, formed by inflated rubber tubes during pouring.

Slabs were poured on steel plates so bottom of slab that forms interior ceiling requires no plaster. Sides that butt against adjoining slabs are also smooth. Remaining sides are rough. Slabs are held in place by grout, hollow openings being sealed off by disk bulkheads placed prior to pouring.

Volcanic pumice is the primary aggregate, giving a 97-lb. per sq. ft. slab. Slabs are designed for a 20-psf. live load, but in tests failures did not occur until 290 psf. was reached.—Eng News-Rec, D 9, 89

Steel Outlook Brighter

Steel production continues high, steel demand strong. But the extreme steel shortage, felt for the last 3 years, should disappear sometime this year.

U. S. steel firms have increased, and are continuing to increase, their capacities by: (1) building more openhearth and electric furnaces; (2) rebuilding older furnaces; and (3) increasing use of blown metal from bessemer converters.

This year, steel output from existing units will be increased. Better performance will result from more and better coal for coking, refinements in uses of oxygen in making iron and steel, and completion of repair programs.—Iron Age, D 16, 129

Converts Sulphide Nuisance into Sulphur Profit

Hancock Chemical Co. at Long Beach, Calif., is now completing a plant which will convert waste hydrogen sulphide from nearby petroleum refineries into elemental sulphur.

The plant combines a Girbotol extraction unit with an application of the Simon-Carves process. In Girbotol unit, the gas is absorbed in an 80% diethanamine solution. This is run through a stripper with 16 trays operating at 18–20 psi.

Hydrogen sulphide from stripper passes through two condensers. Condensate is run through a second stripper. Gas is then partially burned to form sulphur dioxide and a small amount of elemental sulphur.

Final conversion to sulphur takes place in a catalyst-filled converter. Only product besides sulphur is water, which passes off as a vapor mixed with unused H_2S and SO_2. These gases are run through a second converter and a scrubber.—Chem Eng, D, PPI-121

Tests Plated Surfaces

Developed recently at U. S. National Bureau of Standards, the spiral contractometer measures stresses in electrodeposited surfaces. The device utilizes a slight strip wound into a spiral for making measurements.

The strip is plated on one side, and stress in the deposit causes the spiral to wind more tightly or to unwind, depending on whether stress is compressive or tensile. Change in curvature radius of spiral is measured by angular displacement of one end of spiral while other end is held rigid. Displacement can be read on instrument dial.

Stress is then calculated from displacement, spiral dimensions and physical constants, and plating thickness.—Steel Age, O 28, 63

HIGH-QUALITY CASTINGS

Intricate aluminum-alloy castings for Buick Dynaflow rotors are cast in plaster (gypsum) molds by Antioch process. Gypsum porosity is obtained by adding sand, chemical inhibitor, accelerator, and water by this automatic wet mixing machine. Subsequent curing is so carefully controlled that one of two molecules of water of crystallization is retained in mold. When hot metal hits mold, this water turns to steam and chills metal surface so it conforms exactly to mold.—Am Mach, N 18, 120

Protect Treated Abrasives

Calcium-chloride-treated abrasives unprotected from winter weather will lose 79% of their effectiveness; if properly protected, loss will not exceed 17%. In New York State, cotton mats are laid over roadside stockpiles and are coated with tar. In some places, the cotton matting is omitted with good results. Tar paper held in place with lumber is satisfactory protection for long triangular piles. In New Hampsire, shallow trenches are dug, abrasives placed in them, and then a shallow roofed shelter is placed over trench.—Cons Meth, D, 59

Pre-Grinding Video Tubes Cuts Television Bottleneck

Production of television tubes continues to be the bottleneck in production of television sets in the U. S. But Pittsburgh Plate Glass Co. believes they have relieved this problem.

All grinding and finishing of the image surface is done on flat glass, a much simpler process than current finishing of the curved surface. How the finished image surface is curved without damaging the precision surface is still secret. The finished image surface can be fused to either glass or metal tube. Currently face-plates are being made for only 5-in. tubes.

Other Pittsburgh television developments are: mechanical inspection for spherical perfection of face-plates; a high-expansion glass, fusable to low-cost metals; curved "implosion" plate, four to five times the strength of plate glass, to protect tube face from accidental damage; a glass that will not brown after long use; filters to reduce contract loss in overlighted rooms; and a neutral Duplate glass for television studios that transmits only 12½% of the glare from studio lighting.—Business Wk, D 18, 51

Saves $300,000 a Year

New layout of Clark Equipment Co.'s Industrial Truck Div. plant into four main divisions—light machinery, heavy machinery, motor and chassis assembly, and repair and storage—cost $85,000. It will save $300,000 annually. All subassembly operations have been removed from the main assembly line, effecting a 35% drop in assembly costs.

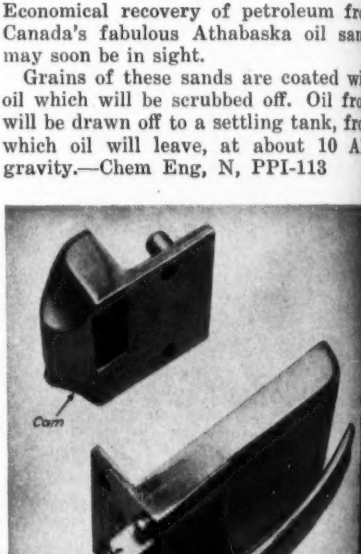
Downtime, which once cost $5 per min. because the entire line was halted, now costs $0.50 per min. A breakdown now can occur on any one line and the three remaining lines can continue operation, working out of production backlog from section having trouble. Palletization has permitted more economical use of storage space. As materials are needed at sub- or main-assembly points, they are moved on pallets. Operators work directly from pallets.

Production areas have been increased by the new layout; handling costs are down 25% as are indirect labor costs.—Factory, D, 114

Oil from Canada's Sands

Economical recovery of petroleum from Canada's fabulous Athabaska oil sand may soon be in sight.

Grains of these sands are coated with oil which will be scrubbed off. Oil froth will be drawn off to a settling tank, from which oil will leave, at about 10 API gravity.—Chem Eng, N, PPI-113



GIVES MAXIMUM SECURITY

New automatic deadlock, made by Ingersoll Locks, Ltd., England, is designed to resist common burglary methods. When door is closed, a cam forces bolt back into lock. This compresses internal spring which projects dead bolt into recess in staple. Inside handle can be locked by key to prevent entry by breaking glass in door and reaching in to move handle.—Prod Eng, D,

...lane and Train Television ...emonstrated Successfully

...ideo fans need no longer stay at home ... see their favorite programs. During ...seball's World Series this fall, pas...ngers on Capital Airlines and Balti...re and Ohio Railroad had their first ...k at traveling television. Capital, on ... DC-4 flying the Washington-Chicago ...ute, has installed a standard home-...del Philco receiver on a small platform ... viewing by all passengers. Three ...dspeakers supply sound.

...Dipole antennae are mounted on short ...sts, one under the airplane and one on ... of fuselage. Antennae are connected ... switch on the side of the receiver so ... airline hostess can choose the ...enna giving the best reception. The ...ne flew at 10,000 ft. and received from ...ions up to 180 miles away.

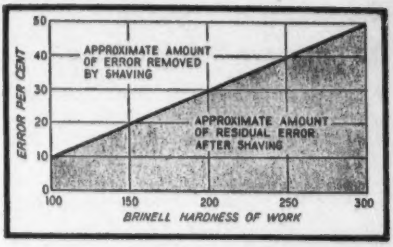
...The train demonstration was made on ... Washington-New York route by ...dix Aviation Corp. A special an...na, known as a ram's horn doublet, ... mounted on the car roof. Ac. needed ... set's operation was obtained by using ...rain radio inverter. Reception was ..., except under bridges or other steel ...ctures.—Electronics, D, 158; 219

...undnut Project Advances

...ted in 1947, the British groundnut ...ect in Tanganyika and Northern ...desia is making progress. It calls ... annual production of 600,000 long ... of groundnuts (peanuts) in 6 years. ...tal of 3¼-million acres will be turned ... productive farmland when the ...ect is completed.

...'47 a token crop was harvested from ... acres ready at the end of the first ...ing season. The '48 program called ...00,000 to 150,000 acres ready for ...ing by December.

...ce April '48, Overseas Food Corp. ...andled the project. Land has been ...ed, both railroad and highways are being built, and a new port is planned. When high production is reached, this project will add 250,000 long tons of oil per year to the world's supply and huge amounts of cake valuable as a high-protein cattle feed.—Food Ind, D, 91



SHAVING REDUCES GEAR ERROR

Correction obtainable by shaving gears after cutting is considered at best to be 10% of cutting error. Amount of correction depends on cutting ability of tool and machinability of material. As machinability, as it affects shaving, is relative to Brinell hardness, above chart serves as guide to correction expected for various materials under good conditions. —Am Mach, D 16, 84

Oil-Well Drilling at 51°

An unusual directional drilling job has just been finished for the California Co. Requirements for the job were to deflect the hole as far as safety would permit and, if possible, to have a horizontal displacement of 1,300 ft. at 4,050-ft. vertical depth.

An 85-sack cement plug was set at 2,350-2,205 ft. After it set, a second plug of 65 sacks of cement was spotted at 2,205-2025 ft. Reflection was started from this plug in the original straight well, using a Livingston-Shrader knuckle guide.

Drift was gradually increased to 48° at 4,047 ft. Then to 4,210 ft., several knuckle guides were run to change the course to 51°. In pulling out of the hole, a surprisingly small drag on the drill pipe was noticed, despite the high hole angle.—Oil & Gas J, N 25, 106

Electric Hot Topping To Improve Steelmaking

A new technique, electric hot topping, is reported to give higher yields of sound ingot metal than do other methods currently in use in the steel industry.

According to M. W. Kellog Co., developer of the process, it prevents formation of pipe during solidification and eliminates the need of cropping the ingot. Heat is supplied by an electric arc to the top of the ingot which is covered by flux.

As a result, a cone-shaped reservoir of molten metal is maintained at the top. This feeds the metal underneath and prevents formation of cavities as volume changes. The process is available for license.—Steel, N 29, 90

British Plant Turns to Oil

The new Bankside Generating Station in London will become the first oil-fired central station in Britain and the first of its kind in the world designed to prevent emission of flue gas with a high sulphur content. Architecturally the building will fit in with surroundings.

The surroundings, which include St. Paul's Cathedral across the Thames River, dictated the use of oil as fuel in order to keep smoke at a minimum. It was also to preserve the facade of the Cathedral that the decision was made to wash flue gases despite the cost. The washing plant will be in the center of the boiler room, occupying the space equivalent to 2½ boilers.—Power, D, 127

Reduces Mixing Time

Koppers Co. is now furnishing the Goldman agitator for chemical- or other industrial-plant installation. This recently patented agitator reduces mixing or washing time materially.

It is constructed so it propels the liquid to sides of tank and upward. At the top, the liquid is drawn to the center where it is pulled downward through the hollow axis on which agitating blades are fastened. Expelled from the bottom of hollow axis, the liquid repeats the process.—Iron Age, N 25, 131

New Textile Equipment Displayed at Exposition

Manual and automatic centralized lubrication systems, Hunt looms and parts for reconditioning, and materials handling equipment were high interest centers at the 15th Southern Textile Exposition held recently at Greenville, S. C.

Centralized-lubrication system delivering measured lubricant to bearings from one supply point was shown by Alemite Div., Stewart-Warner Corp. Pump forces lubrication through system until each valve discharges a measured amount of grease. Indicator at intake point indicates when proper lubrication is accomplished. System can be applied to almost all textile equipment.

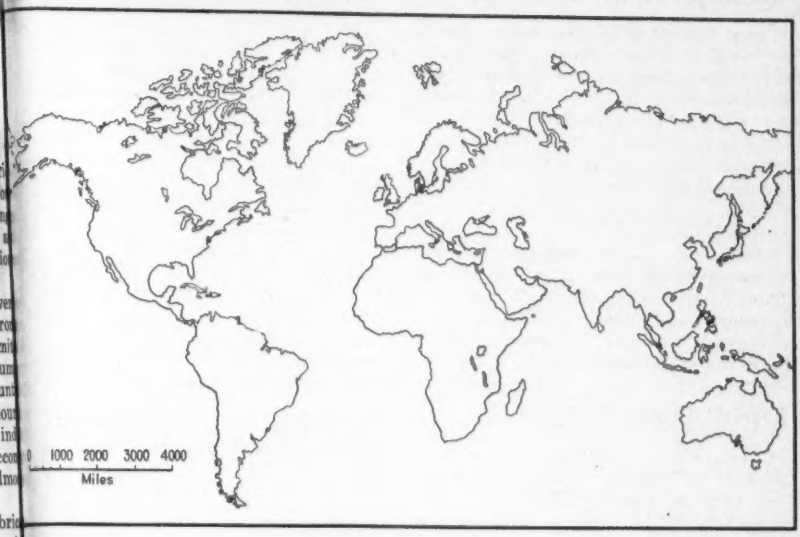
Centralized one-shot bearing lubrication system for drive-end of spinning frame was exhibited by Bijur Lubrication Corp.

Slasher-yarn lubricating system developed by Southern Sizing Co. applies lubricant to yarn between size box and slasher cylinder. Fatty or waxy lubricant reduces warp and filling stops.

Two new Hunt Machine Works looms equipped with spreaders for cotton and/or rayon up to 61 in. wide were displayed. A new high-speed controlled-density warper for synthetics and cotton yarns, developed by Allen Co., was shown. Uniform yarn density during beam build-up is accomplished by hydraulic cylinders controlling pressure between beam and cylinder at all times.

Louis Allis Co.'s new ac., variable-drive motor transmits controllable torque over a stepless range of speeds by electro-magnetic forces. There is no mechanical linkage between driving and driven members.—Textile World, N, 147

World Economic Outlook



usiness, Industrial Progress o Continue Through This Year

ASED ON DIRECT REPORTS from major industrial countries, McGraw-Hill st presents a survey of world eco- ic prospects for 1949. The outlook ptimistic; a few danger points have ared. Politically the world should able through 1949, China excepted.

ch Expect Banner Year h Marshall Plan Help

CH BUSINESS, and American busi- en operating in France, expect a business year in 1949 than the us year. They think it may be a er" year—if there is no war and to the Marshall Plan. Their hopes are based on two assumptions: that France will avoid internal political upheavals this year—neither the Communists nor de Gaulle will unseat the Third Force—and that the French economy is basically sound and will continue to make gains if no political changes come.

Reasoning for this French optimism is plain. The Communists were decisively beaten in the recent strikes. Communist grip on miners, stevedores, railroad workers, seamen, and metalworkers was badly shaken. Weeks before the Communist-dominated General Confederation of Labor called off its 2-month-long coal strike, 90% of the miners were back in the pits. Communist attempts to spark

strikes among seamen, stevedores, railroaders, and metalworkers failed.

This is significant in two ways. Firstly, twice the Communist-dominated Confederation failed to control its rank and file. They do not, then, have a chance of winning control of the country. Secondly, and possibly more significant, the wobbly moderate coalition governments stopped the Communists. The Third Force apparently is stronger than people believed.

De Gaulle Politically Dead?

General de Gaulle apparently committed political suicide when he announced that France could pass up Marshall Plan aid in a pinch, denounced Western Union, and spurned collaboration with the Third Force. His all-or-nothing stand drove many neutrals to the Third Force. Those neutrals share the General's fear of German recovery, but they are not willing to risk shattering the semblance of western European recovery already appearing under the European Recovery Program.

Elimination of the de Gaulle and Communist threats will give the Third Force a chance to trim the French economy. Inflation must be halted. French businessmen agree that the instability of the franc is the only obstacle to French recovery. They believe Marshall Plan goals could be surpassed easily if the franc could be stabilized.

Production is increasing and should help check inflation. The recent strikes hurt, with production falling from its summer peak of 117% of 1938 to 90%. In less than a month following the strikes, it recovered to 110% with no signs of leveling.

The harvest of last year was 93% of prewar, the best in several years. It should help to slow the rising cost of food. Should good weather hold, next year's crops should be even better.

Production, although improving, is not keeping up with inflation. Prices have risen to 18 times prewar levels; they have outstripped wages 30%.

These prices keep French goods out of world markets. Exports at the end of 1948 were remaining about 25% behind imports, about the same as 1947. Inflation is eliminating credit fast—now only 10% of the national investment program is covered by private loans.

Tough deflationary measures must be taken by some government. It will have to balance the budget, raise taxes and collect them, cut administrative expenses, and scrap subsidies to nationalized industries. If not, the country faces a deep cut in its standard of living.

Even if the Third Force should fail to take these steps, France should be better off a year from now than it is today. But France may not be well enough off to insure the country against brankruptcy when Marshall Plan ends.

No Indian Business Advance; Government Problems Great

IN BOMBAY, India's first commercial city, businessmen believe the coming year will be a tough one but that they will end the year all right. From the directors of the mighty Tata industries to side-street merchants, business men do not believe any great business advance is in the immediate offing. They will determine final government policy and make at least a start toward implementation of that policy.

Most of them believe government problems are greater than their own. The crushing food import bill of over $300 million and resettlement of over a million refugees appear to be the biggest problems facing the youthful government. Increased concessions to labor, accompanied by decreasing production, have boosted inflationary tendencies.

The government has succeeded in two major undertakings—independence and integration. Indian businessmen are awaiting a third success—development of the country's industry.

Businessmen have faith in their governmental leaders as individuals but lack

confidence in their fixity of purpose and administrative ability. They are scared by talk of nationalization, perplexed by widely divergent statements by cabinet ministers, irritated by the maze of ill-drawn and poorly administered regulations. But no industrialist desires a change in government leadership.

Any other government would have to be based on religious or class biases. The current government has the widest possible appeal. The leftist trend is natural in view of the masses of half fed, half clothed, illiterate people. Business only wonders how far the trend to the left will continue.

May Balance Books

Some people believe the government's books may be balanced this year. Imports must be reduced and exports increased if the country is to pay out of current earnings for the much-needed food imports instead of using dollars needed for capital goods. The government must peg wages to production to help halt inflation.

Businessmen are dubious as to how quickly the government will get down to serious development. Sir Hami Mody, ECA director, believes "ideological experimentation may continue 3 to 5 years. . . . The government appears to realize that the confidence of investing public and business must be restored before real economic advance is possible."

...ation of West German State ...Become Reality This Year

WESTERN GERMANY will see, in the coming year, the creation of a West German state and the elimination of military government in daily business life. However, the military forces will remain in Germany until a final peace is realized. The new German government will not solve broad economic questions, such as nationalization, but will have to deal with prices, credit, exchange rates, and possibly with a controlled vs. free economy. A swing left—to the Social Democratic Party—can be expected, especially if high prices are not halted.

The businessman or industrialist in west Germany does not face the hopeless situation his counterpart does behind the "iron curtain." There the counter-blockade has cut raw materials from the west, leaving spotty supplies from satellite countries as his source of supply. There German free enterprise is gone.

The June currency reforms were helpful. Production rose from 40% of 1936 to 70%, where it has levelled off. Worker productivity rose, following stabilization of the mark and food rationing.

After currency reform, industry hoped it could proceed without controls. But a danger spot has appeared in consumer lines. Demand for these—especially shoes and clothing—has not been satisfied and domestic production cannot seem to bring prices down. Controls may be necessary.

Taxes, Living Drain Capital

Little investment capital is to be found. High taxes and living costs leave little for savings. Currency reforms eliminated what savings and investment capital were available. A Reconstruction Finance Corp. loan, financed by Deutsche Mark counterpart funds, will be made; probably first call on the loan will be for increasing power capacity and building Ruhr housing.

Foreign capital will be invited to invest in Germany early this year. Most needed are machinery and equipment on a company-to-company basis. Investments will go into heavy electrical equipment, textile machinery, milling equipment. Coal and steel are unlikely to attract investments because of their cloudy future.

Power shortage is industry's greatest handicap—almost as great as food was a year ago. Little expansion took place in the past 2 years, and some capacity has been moved east or lies in the eastern section of the country.

Completion of 5-Year Plan In 3 is Russian 1949 Goal

RUSSIA'S INDUSTRIAL and economic outlook for 1949 boils down really to a survey of what was done in 1948. Predictions of the future is next to impossible.

In a recent letter to premier Stalin, 2½-million Moscow-area workers pledged completion of his 5-year plan by midsummer 1949, 18 months ahead of schedule. Economic sights are being laid on a second postwar 5-year plan. One has already been announced for the Moscow basin coal fields, a 150% increase in output to be effected during the 1949-1953 plan years. Similar programs will undoubtedly be applied to other industries and areas as their current plans near completion.

Postwar progress of the Moscow area —producer of motor cars, trucks, tires, subway cars, locomotives, textile machinery, electrical equipment, and many other items—appears impressive from current reports. Compared to 1940, production was up 29.2% in October 1948. For the year, 26.3% more goods was produced in 1948 than in the preceding year. Schedules for 1948 were completed in the Moscow area 5 weeks ahead of schedule—500 plants reported completing their 5-year plans in 3 years.

Important production advances were reported, as stated, from Moscow basin coal mines. Production reached 2.5 times prewar tonnage. War-wrecked mines have reopened with much new mining capacity opened in the year. To reach its 1953 goal, an even faster pace must be maintained than last year.

Argentina Must Revive Trade; State Control Hobbling It

BIGGEST QUESTION facing Argentina, as 1949 opens, is the question of state-controlled trade. Should Argentina continue tight control of the Central bank with a state trading agency doing most of the country's buying? Or should trade be resumed through private channels?

Tight business controls by the state, directed by economic czar Miguel Miranda, have hurt the country's economic position. Argentina is almost out of dollars. Trade with the U. S. has dwindled to a mere trickle because of greatly inflated prices which are inflated far beyond world prices. Now Argentina's meat trade with England is threatened.

There are three courses open to Argentina:

(1) She can continue with her policy of state trade control and high prices, and see internal industries wither from lack of replacement parts for equipment, component parts, and materials.

(2) Miranda could put the country back into foreign trade by unfreezing his reported 4- and 5-million tons of grain, 350-million tons of linseed oil, 2-million hides. These stores he owns personally and can be placed on the market only by him.

(3) President Peron could junk his state trading policy and let private business again enter into foreign trade. This third course is the one Argentine business hope he follows.

Peron Committed to Program

But the president is committed to his present economic program, shaped and directed by Miranda. He appears to have complete faith in Miranda and no change appears imminent.

Peron seems undisturbed by several unsteadying factors:

Many large U. S. manufacturing plants (Ford and General Motors for instance) have been idle for nearly a year because of import restrictions. The five-year plan (see McG-H Digest, April 1947, p. 35) has bogged down and is so far off schedule that it is doubtful whether the plan can be revived. Local industries, hampered by lack of spare parts and raw materials, are being forced to curtail production.

Non-Argentine economists have made suggestions to the president of ways to prime his economic pump and improve his faltering world-trade position. Peron seems receptive to the suggestions, but none of them has been put into effect.

Transportation Bottleneck To Brazilian Development

TWO MAJOR WORRIES concerning industrial and economic prospects for 1949 face Brazilian businessmen:

Can Brazil get more dollars?

Will inflation run wild?

Trade with U. S. showed a deficit for 1948, and prospects of expanding exports to the U. S. do not look bright. Prices are following wage increases along an inflationary spiral.

Some Brazilians believe the forthcoming report of the Joint Brazil-U. S. Technical Commission will comprise their 1949 economic forecast. The report is to be published in February.

Coffee Exports Will Not Rise

Coffee is the country's biggest export item, accounting for 39% of export trade the first 9 months of 1948. This was about 2-million bags ahead of 1947 exports for the same period. There is little reason for optimism that exports to the U. S. can be raised during 1949.

Minerals and petroleum seem the best prospects for added export dollars in the coming year. The mineral deposits are known. But petroleum still has not been proved except near Bahia, although geologists feel sure it is present in other localities. Foreign companies would like to exploit these possible fields but are frightened by long-pending legislation which would put refining and local distribution in Brazilian hands. Expropriation is still a threat to foreign investment. Some guarantee of return on expatory costs must be given.

In the Minas Gerais belt are millions of tons of high-grade ore, but adequate transportation to bring it to port is nonexistent. Ores now move to ports at the rate of only a few hundred thousand tons a year. Iron ore, even though inflated, sells because of scrap scarcities, but this market may go if processing lower-grade ores in the U. S. materialize. American steel companies would like Brazilian manganese if the price were right. But again cost of installing proper transportation is prohibitive.

Certainly poor transportation will be covered by the Joint Commission's report. It is not a problem that will be solved overnight.

Some Dollars Coming In

Lesser exports—cocoa, oils, nuts, and other minerals—will continue to bring small amounts of dollars through 1949, but overall prospects for the year are not for much improvement. Until exports to the U. S. are expanded, imports will be restricted to an "essential" list.

The federal budget for 1949 calls for a 1.2-billion cruzeiros (about $60-million) deficit. President Dutra hopes not to spend all budgeted funds; this means his 5-year plan will be delayed.

At the close of 1948, the black market was paying 25 cruzeiros for a dollar, against an official rate of 18.38. As prices rise, exporters may demand devaluation.

Year To Shape China's Future; Prospects Dim At Best

THIS YEAR—1949—will be the most climactic year in China's history. The year may go something like this:

Additional Communist victories will put the Chinese Red Army on the north bank of the Yangtze. General Chiang Kai-shek will abdicate. The new government at Nanking will negotiate for a truce to end the war. The government will be composed by a new Nanking group and Communists and bring real peace to most of China. Communication within "coalition-controlled" China will be restored, internal and external trade will resume.

Some fighting may continue between the new coalition government and semi-independent warlords in remote provinces such as Yunnan. But to most of China, composed from the two fighting sections today, peace will come during 1949. As 1948 ends, this is China's new year wish.

Chinese businessmen remaining in Tientsin report vast quantities of pig bristles, sheepskins, sheep hair, ground nuts, soybeans, and coal for shipment as soon as the railroads are in operation.

Business May Remain

Chinese communists are reportedly asking western businessmen to stay. With large inventories already in China and with years of investment in goodwill, many will be forced to stay and salvage whatever may be gotten out. Reports from Harbin indicate that little trade is taking place with Russia. It will be recalled that over a year ago a chief aide of Communist leader Mao Tze-tung said "Russia has little to offer China."

Some Chinese believe trade under a coalition government will be much freer than it has been under the Kuomintang. They say the currency will be stabilized; red tape of the Nationalist government will be eliminated. Trade bureaus, now operating in Red-held areas, will continue to operate, private traders being free to buy from other private sources after a certificate is obtained from the bureau.

Foreign capital investment may be welcome "under certain conditions," presumably calling for turning over of ownership and management to nationals within a specified length of time. Those factories now owned or operated by foreign capital will continue under their present management unless that management is connected with China's four industrial families.

Real question about China's future is whether Chinese Communists are true Chinese or Russian-guided satellites.

Britain's Outlook Brighter As Pound Firms, Trade Holds

BRITAIN'S INDUSTRIALISTS may find themselves operating in their first buyers' market, both at home and abroad, since before the war. British exporters are facing shrinking markets because prices are high and going higher and import restrictions in other countries limit potential markets.

Government export quotas for 1949 are set at 150–155% of 1938, as compared to 140% for 1948. The increase is at a slightly lower rate than last year.

Optimism is growing in the country. The pound sterling has firmed. Its weak convertibility crisis passed in mid-1947. Should productivity continue up and exports hold, Britain will find her economic structure sounder by the end of 1949. Talk of devaluation has cleared. It certainly will not come during this year. Foreign businessmen in the country believe that the pound must be devaluated to a more realistic exchange rate eventually.

Labor stortages are being felt. Productivity has not risen as desired. New machines and new wage-incentive systems have helped. Yet many workers still prefer days off to added take-home pay. On the whole, labor is much better off today than it has ever been.

Heavy taxation has seriously reduced business incentive. Yet there are still many opportunities for generous business profits, especially in the service industries. The threat of nationalization still hangs heavy over industry.

Investment Capital Scarce

Politically, no changes are expected during this year. Even though an election should come this year or in 1950, chances for a Conservative victory are dim. A turn to Conservative legislation is next to impossible. Economic thinking of Sir Stafford Cripps will dominate Britain's economic life for years to come.

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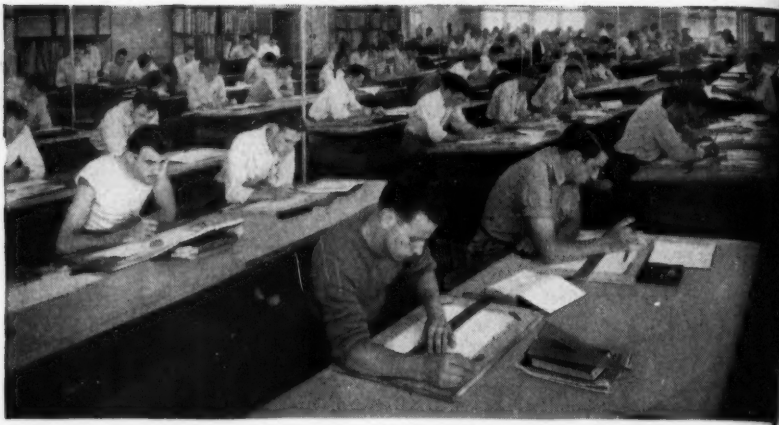

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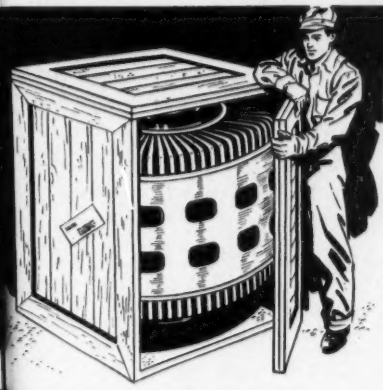

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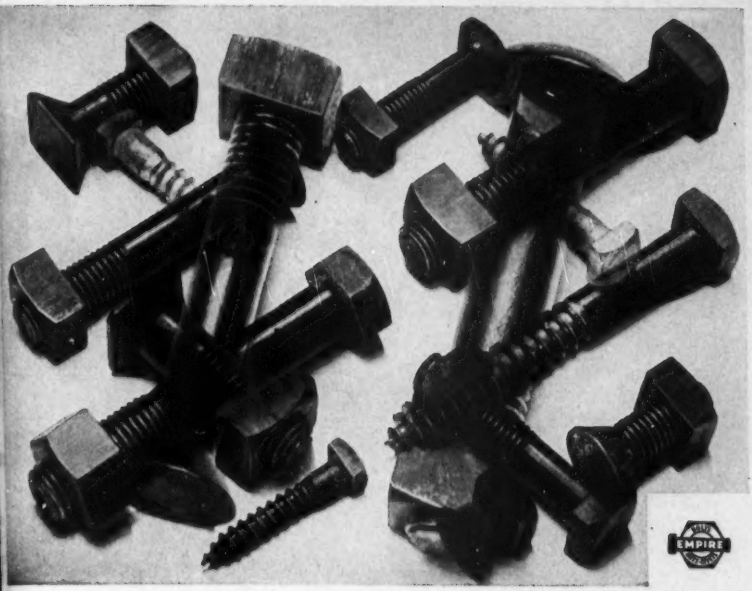

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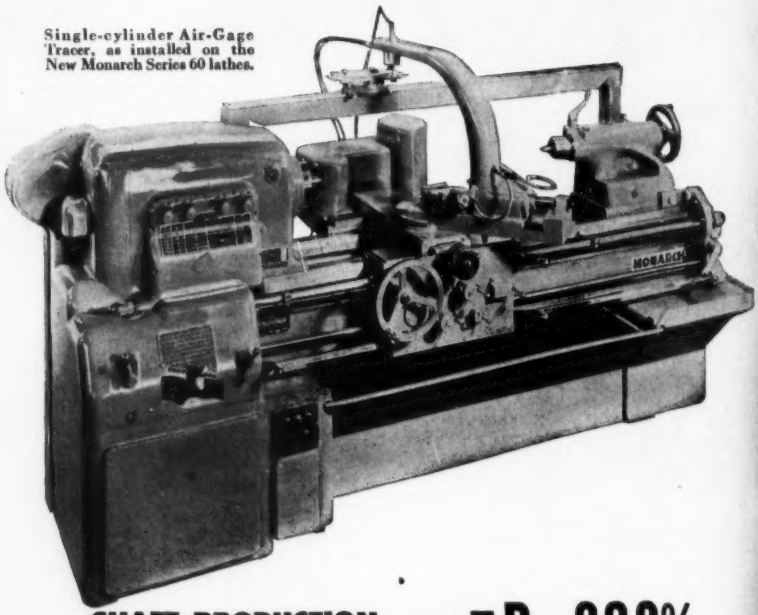

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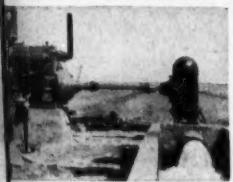

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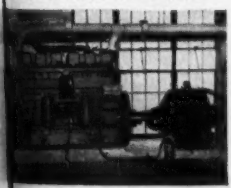

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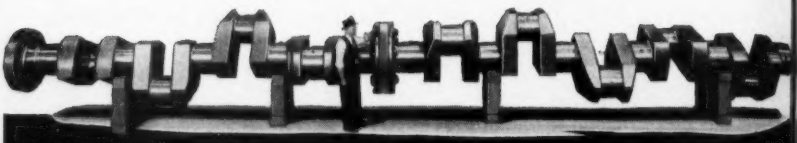

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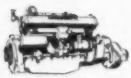

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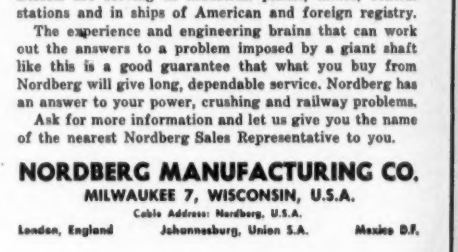

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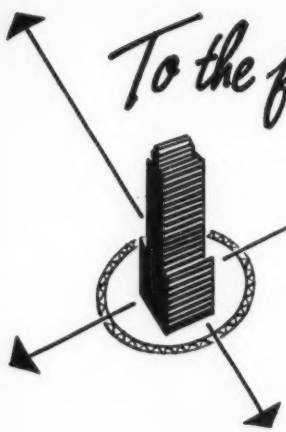

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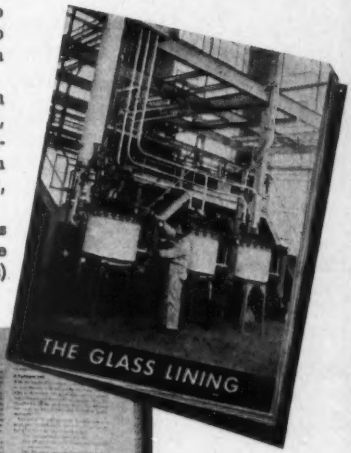

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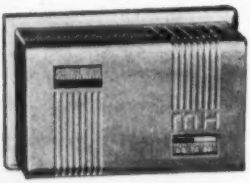
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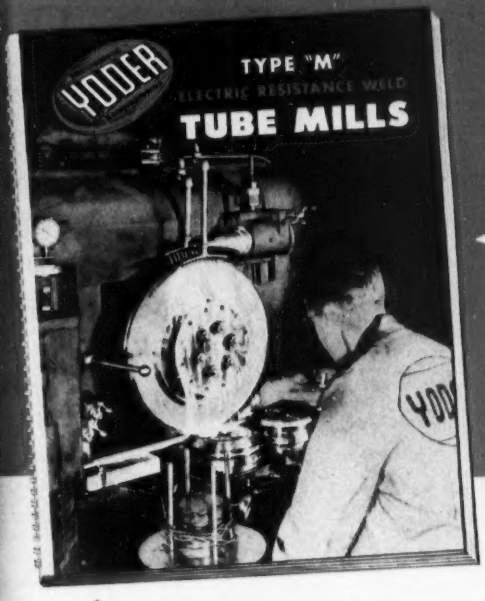

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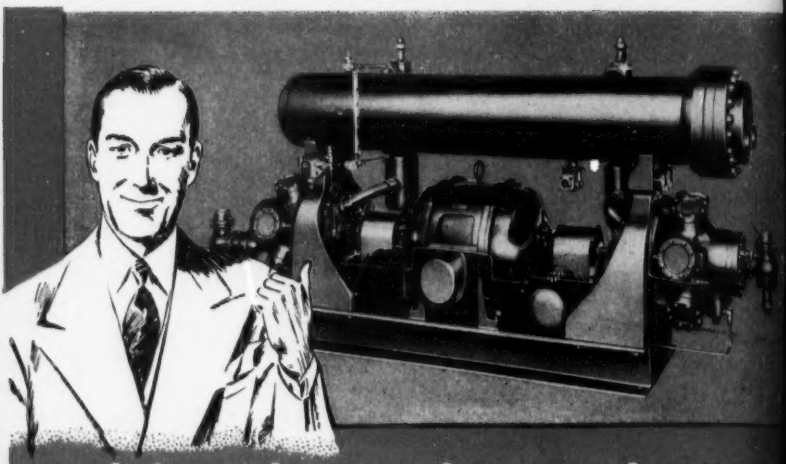

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